RUNNING ON EMPTY

The impact of challenging student life on
wellbeing and academic performance

Jolien Dopmeijer

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Just keep me where the light is

John Mayer

Student Kunstgeschiedenis en winnaar van tv-programma Project Rembrandt Sebastiaan Groot (23) over *Een vallend boek*: 'Meer dan één op drie studenten heeft een verhoogde kans op een burn-out. Dat is tweeënhalf keer zoveel als de gemiddelde Nederlander. Aan de hand van verhalen van verschillende studenten die een burn-out of depressie hebben gehad, toon ik met dit schilderij een verbeelding van burn-out en depressie.'

Student Art History and winner of the television show Project Rembrandt Sebastiaan Groot (23) about *A falling book*: 'More than one in three students are highly at risk for burnout. That is two and a half times as much as the average Dutchman. With this painting, that was based on stories of different students that went through the experience of burnout or depression, I try to depict the experience of burnout and depression.'

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ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor

aan de Universiteit van Amsterdam

op gezag van de Rector Magnificus

prof. dr. ir. K.I.J. Maex

ten overstaan van een door het College voor Promoties ingestelde commissie,

in het openbaar te verdedigen in de Aula der Universiteit

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door Jolien Mariët Dopmeijer

geboren te Emmeloord, Noordoostpolder

Promotiecommissie

Promotor:	Prof. Dr. R.W.H.J. Wiers	Universiteit van Amsterdam
Copromotor(es):	Dr. J.M. de Jonge	Hogeschool van Amsterdam
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	Prof. Dr. G.J. Overbeek	Universiteit van Amsterdam
	Dr. H. Larsen	Universiteit van Amsterdam

Faculteit der Maatschappij- en Gedragswetenschappen

Voor Hugo, Loïs en Robin

CONTENTS

PROLOGUE

I need peace of mind
Help me carry on

I've Been Dazed
Michael Kiwanuka (2019)

VERA'S STORY

I met Vera when she was only 20 years old and had just received the devastating message that her mother had fallen ill again and was not going to survive. I knew Vera as a smart and dedicated nursing student in her fourth year of study who, like most other students, was also struggling to find her place in the world and discover ways to cope with demanding student life: striking a balance between studying, working, hanging out with friends, dealing with questions of fitting in, being good enough, whether or not to move forward with a newly found relationship, and she had to find out where she stood. Suddenly, that devastating message made her drop everything in order to be able to care for her mother on a daily basis, even in the most intimate situations when she had to watch her mother experience pain every single day. In the months that followed, her mother's cancer progressed rapidly. Vera's plans to move out were postponed as she was taking care of her mother all by herself. Her parents had gone through a difficult divorce and her siblings had already moved out. They had started their own families and lived far away. Vera began to feel exhausted, depressed, and lonely, and she lost confidence in herself and her ability to finish her studies. It became more and more difficult to concentrate on study tasks, to turn assignments in on time, and to pass exams, although she still loved her studies and wanted to be a nurse very badly. Ultimately, she felt more and more alienated from her studies as she experienced delay, and she started to consider dropping out of her programme so that she could catch her breath.

*The name is fictitious for privacy reasons

CHAPTER 1

GENERAL INTRODUCTION

Work it harder
Make it better
Do it faster
Makes us stronger

More than ever
Hour after hour
Our work is
Never over

Harder Better Faster Stronger
Daft Punk (2001)

Although student life, with all its new experiences and challenges, is often referred to as a very positive period in life, research among students has demonstrated that, in fact, many experience it as a difficult and stressful time (McLafferty et al., 2017; Niazi & Mehmood, 2017; Stoliker & Lafreniere, 2012). Starting university is a key life transition that takes place in a crucial developmental period when students make the transition from late adolescence to young adulthood, also known as 'emerging adulthood' (Arnett, 2000). According to Erikson's classical theory of psychosocial development, this is a vulnerable time of rapid development and change in which young adults form their identity, a stage that revolves around the search of self and finding a sense of belonging (Erikson, 1968). It is a time of learning and adjustment in which social and affective processes have crucial roles (Crone & Dahl, 2012). During this transitional period, students often struggle with a number of stress factors as they become less reliant on their parents and begin to shape their own lives (Karatas & Cakar, 2011). They are on the verge of exploring a variety of life directions in relationships, studies, work, and world views: they find that many directions are possible. This makes many emerging adults feel insecure about making the right choices. They struggle with who they are, what they want, and how to be good enough in the eyes of others.

The emotional challenges involved in a student's transition to a less structured university environment with high study demands and financial pressures can be significant additional stressors. Performance pressure has shown to be highly prevalent among students, as reported in preliminary studies that led to the current dissertation (Dopmeijer, 2018). This finding is consistent with findings discussed in several recent reports stating that today's performance-oriented and individualistic society makes many young people feel burdened by performance pressure and that a strong appeal is made to their resilience (Raad voor Volksgezondheid en Samenleving, 2018; RIVM, 2017; Sociaal-Economische Raad, 2019; Kleinjan et al., 2020). In their experience, students often face high expectations to succeed, and they go to great lengths to meet these. In the subsequent process of adjusting to circumstances within the educational setting, however, not every student manages to find a balance (Dopmeijer et al., 2018).

VERA IS NOT THE ONLY ONE

Vera was introduced in the Prologue, and her story is not an isolated case. Unfortunately, there are many students like her: students who are dedicated to their studies but who find themselves faced with the challenges of student life and sometimes, on top of that, impactful life events in their personal lives. To illustrate, preliminary studies that led to this dissertation showed that 8% of the students at

the university of applied sciences where the research described in this dissertation took place are informal caregivers: like Vera, they combine this stressful task with their studies. One third of caregiving students reported that their caretaking tasks had a negative impact on their studies (Dopmeijer, 2016, 2018). These findings are consistent with results reported in a study by the (Dutch) Expertise lab for Young Informal Caregivers, which also showed that caregiving students report long-term physical and psychological strains more often than non-caregiving students (Tienen, de Boer, Roos, Van der Heijde, & Vonk, 2016). In line with their developmental stage, most students are just *beginning* to learn to recognize subsequent stress reactions and to cope with them. This in itself is already a challenge, and having to deal with private situations seems to further increase perceived performance pressure and to make this developmental stage even more stressful.

PSYCHOSOCIAL PROBLEMS AMONG STUDENTS

Although stress and performance pressure are not pathological factors *per se* and may even contribute to successful academic performance, they also contribute to psychological problems among students (Raad voor Volksgezondheid en Samenleving, 2018; Royal College of Psychiatrists, 2006). Most mental disorders are known to have their first onset before age 24 (Kessler et al., 2005; Paus, Keshavan, & Giedd, 2008), and this peak period coincides with the period of student life. For a number of students, pre-existing psychosocial problems may persist or worsen during the course of their studies, while others develop psychosocial problems for the first time (McLafferty et al., 2017; Stoliker & Lafreniere, 2012; Tosevski, Milovancevic, & Gajic, 2010). In fact, several studies have clearly demonstrated that mental health problems are highly prevalent among students and that students report more health problems than their working peers (Boot, Donders, Vonk, & Meijman, 2009). Among other symptoms, they mainly report high levels of stress, loneliness, and symptoms of anxiety and depression (Auerbach et al., 2016; Newcomb-Anjo, Villemaire-Krajden, Takefman, & Barker, 2017; Tosevski et al., 2010). Furthermore, studies have shown that burnout symptoms have also become a common problem among students (Dyrbye et al. 2008; Ishak et al. 2013; Reyes et al. 2016; Stoliker & Lafreniere 2012). Additionally, hazardous alcohol use has been found to be highly prevalent among students; they drink more than their peers who are not attending higher education (Dawson, Grant, Stinson, & Chou, 2004; Jackson, Sher, Gotham, & Wood, 2001; Kypri, Cronin, & Wright, 2005; Peeters, Oldehinkel, Veenstra, & Vollebergh, 2019).

The high prevalence of psychosocial problems among students has become a growing concern, but what appears to be even more concerning is that students seem to encounter barriers in disclosing mental health issues and seeking help. As a result, the majority of students with psychosocial problems are not receiving treatment (Eisenberg, Hunt, & Speer, 2012), or they start asking for help when problems are already in an advanced stage. This leads to long waiting lists and raises the question as to what specifically causes these experienced restraints. For young adults in their developmental stage, having a sense of commitment and fitting in with their peer group is extremely important (Crone & Dahl, 2012; Erikson, 1968). Emerging adults are so eager to be affirmed by peers that they can be very afraid of (being forced into) activities in which they might experience ridicule or self-doubt, which would make them feel ashamed (Erikson, 1968). As stated before, students seem to go to great lengths to live up to expectations, often also those from their parents whom they do not want to disappoint. It also means that students with psychosocial problems are confronted with the dilemma of disclosure. In this respect, the literature suggests that stigma could to be a key factor contributing to decisions concerning disclosure and help-seeking - and as such a factor that is worthy of further investigation.

THE ASSESSMENT OF STUDENTS' PSYCHOSOCIAL PROBLEMS

Although the growing concern regarding students' psychosocial problems is clear, differences in the assessment of psychosocial problems may impede the adequate overall interpretation of prevalence rates of some of students' psychosocial problems, as part of student research concerns the assessment of mental health *disorders* and the other part concerns the sole assessment of *symptoms* of these disorders. Additionally, it is questionable whether all current screening instruments for psychosocial problems are sufficiently discriminatory for students with regard to their specific developmental challenges. For example, high levels of alcohol use are known to be part of student culture, and as a result current screening instruments and cutoff points for hazardous alcohol use appear to lead to an overestimation of students who are possibly at risk for alcohol use disorder (witness the hazardous alcohol consumption rates among students of 88% as found during the preliminary investigations that led to the current dissertation) (Fleming, Barry, & MacDonald, 1991; Kokotailo et al., 2004; Dopmeijer, 2018). This calls for more detailed research on the validity and reliability of the assessment of students' hazardous alcohol use.

CONSEQUENCES OF PSYCHOSOCIAL PROBLEMS AMONG STUDENTS

Previous studies have shown that students with mental disorders are twice as likely to drop out without obtaining a degree (Hartley, 2010). Of all students enrolled in universities of applied sciences (UAS) in the Netherlands in 2017, 38% dropped out without a diploma, a group of which 16% left the university after their first academic year. In total, 62% of all UAS students obtained a diploma, a group in which 30% graduated on time. Of all students enrolled in Dutch research universities, 18% dropped out without a diploma, a group in which 7% (which is a larger group compared to 2013) left the university after the first academic year. In total, 80% of all university students obtained a diploma, but only 35% of students in this group graduated on time (Inspectie van het Onderwijs, 2020). Ultimately, 32% of all graduated UAS students and 45% of graduated research university students experienced academic delay.

Academic delay and dropout have been recognized as important problems in higher education with impactful consequences (i.e., psychological as well as financial repercussions) for the individual student, the educational institution, and society (Lassibille & Gómez 2008a). Since the 1970s, a significant number of international studies have been dedicated to questions regarding predictors of academic success and failure, mainly in terms of dropout (Van Onzenoort, 2010). For example, extensively investigated reasons for dropout include students' motivation and social and academic integration (Prins, 1997; Van Onzenoort, 2010). An often used model for understanding student behavior regarding dropout and dropout decisions is Tinto's model of student retention (Tinto, 1975). Tinto states that the better a student is academically and socially integrated, (e.g., displaying a strong sense of belonging and commitment to the university, the study program and the people involved), the better the chances for this student to adequately adjust to the new study environment and student life, with reduced chances of dropout as a consequence. Further work based on Tinto's model has shown that students who had a greater sense of belonging on campus reported fewer instances of feeling stressed, depressed, or upset (Stebleton, Soria, & Huesman, 2014). Furthermore, individual characteristics play an important role in one's ability to cope with challenging student life, and studies have shown that personality traits are important moderators determining the degree of psychological distress that students report as a result of their studies (Hunt & Eisenberg, 2010). There is evidence that these psychosocial problems often lead to students feeling less engaged in their studies, which in turn can have a serious impact on academic performance (Stoliker & Lafreniere, 2012) and may subsequently lead to academic delay and dropout

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(Bruffaerts et al., 2018; McLafferty et al., 2017; Zivin, Eisenberg, Gollust, & Golberstein, 2009).

In recent years, the national debate about the alarming delay and dropout rates in the Netherlands has triggered several policy changes and intervention approaches in higher education, with a focus on investments in the quality of university staff, the enhancement of students' decision-making process when it comes to selecting a study programme, and supporting students' motivation not only at the start of their studies, but throughout their time at university. This includes the reinforcement of selection criteria upon admission and a binding recommendation of (dis)continuation[1] (Commissie Toekomstbestendig Hoger Onderwijs Stelsel, 2010). Nevertheless, although delay and dropout rates have slightly decreased, they still remain high; policy makers and universities are currently seeking ways to decrease these rates further.

Academic delay and students' decisions to withdraw from their study programme are multidimensional and complex phenomena that can be viewed from various angles and perspectives (Sarra, Fontanella, & Di Zio, 2018). Although a cross-sectional correlation between students' psychosocial problems and academic delay and dropout has been established, less is known about longitudinal relationships. Also, studies that have examined the association between personality profiles and psychosocial problems on the one hand and academic delay and dropout on the other hand are scarce. Often, academic delay and dropout are seen as educational outcomes that can be measured at a particular point in time, but it seems more appropriate to view them as a process of disengagement that occurs over time in which we may be able to detect early signs of psychosocial problems (Archambault, 2009). If we were able to observe early warning signs among students, this would offer ample time to intervene with the aim to prevent students from experiencing delay or dropping out (Rumberger, 2001). This calls for insights not only into the psychosocial factors that affect the individual students themselves and that contribute to help-seeking behavior and academic performance, but also into relevant contextual factors that play a role.

Therefore, the overall aim of this dissertation is to provide insights into characteristics of students with psychosocial problems and the valid and reliable assessment of

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1 The European Credit Transfer and Accumulation System (ECTS) is a tool of the European Higher Education Area for making studies and courses more transparent. 60 ECTS credits are the equivalent of a full year of study. The institution concerned determines the threshold value that must be achieved at the end of the first academic year in order to continue the study after the first year. The corresponding advice is called the binding recommendation of continuation. If this recommendation is negative, the student is obliged to quit the study.

these characteristics. Another aim is to provide insights into the association between students' psychosocial problems and academic delay and dropout. Furthermore, this dissertation aims to provide insights into predictors of students' psychosocial problems as well as disclosure and help-seeking behavior when these problems occur. These insights are expected to contribute to targeted interventions for both the individual student and the study environment, and they will also likely contribute to the development of student wellbeing policies within universities. This should give students the opportunity to grow as a person and as a future professional. To obtain the necessary insights, four empirical studies were carried out with cross-sectional as well as longitudinal quantitative designs.

OUTLINE OF THE DISSERTATION

The first study (Chapter 2) focuses on contextual factors that contribute to psychosocial problems among students. It examines the roles of performance pressure, loneliness, and a sense of belonging in predicting burnout symptoms among students. Chapter 3 examines the concurrent validity of the Alcohol Use Disorder Identification Test – Consumption (AUDIT-C) in a sample of 5,401 students from a research university and a university of applied sciences and suggests the most appropriate cutoff points. The AUDIT-C is the abbreviated version of the AUDIT, a screening instrument for measuring hazardous alcohol use among the adult population developed by the World Health Organization (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). Chapter 4 examines whether students' psychosocial problems, self-esteem, and personality profiles can predict academic delay and dropout. A prediction model based on symptoms of anxiety, depression and hazardous alcohol use, self-esteem and anxiety sensitivity, hopelessness, and finally impulsivity and sensation seeking is developed on the basis of data from a freshmen cohort (n=962) and validated with data from a second freshmen cohort (n=520). In the fourth study (Chapter 5), predictors of disclosure and help-seeking behavior are examined based on perceived public and personal stigma, and students' attitudes towards disclosure and help-seeking behavior collected from a sample of 1,791 students of a university of applied sciences in the Netherlands. Finally, Chapter 6 presents an overall conclusion. It discusses the results of the four studies in the light of current knowledge on relevant societal developments and student wellbeing in education in general. Additionally, the chapter summarizes the study's limitations. It concludes with suggestions for future research and implications for student wellbeing in (higher) education and for the development of government policies.

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CHAPTER 2

The role of performance pressure, loneliness and sense of belonging in predicting burnout symptoms in students in higher education

ABSTRACT

Student burnout is raising an increasing amount of concern. Burnout often leads to psychosocial problems and drop-out. In this study path analysis was used to examine the impact of performance pressure, loneliness, and sense of belonging on the underlying dimensions of burnout in 3,134 university students in the Netherlands. Results suggest that sense of belonging could be targeted as a way to enhance student wellbeing, in order to improve the ability to cope with the high demands in student life and the prevention of burnout.

INTRODUCTION

For many students, their time at university is stressful, marked with many new experiences, challenges and life events (1). Perhaps stronger than previously, student life is about meeting high expectations: getting good grades, building a resume and a good career start next to a rich social life (2). Recent reports show an increase in perceived performance pressure among students leading to psychosocial problems, particularly burnout symptoms (2,3). Accordingly, several studies have shown that experiencing burnout symptoms has become a common problem among students in higher education, with the reported prevalence ranging between 45 and 71% (1,4–6). Burnout symptoms often lead to students feeling less engaged in their studies, poor academic performance, study delay and drop-out (1,7). Over the past years, researchers have found that those students who report feelings of burnout are more likely to experience poor physical health and cardio-vascular disease (8), psychological distress such as depression (9) and even suicidal ideation (4).

Burnout refers to a state of psychological exhaustion and is originally known as a work-related phenomenon defined as 'a psychological syndrome as reaction to chronic interpersonal stressors at work' (10). This reaction consists of feeling exhausted, experiencing depersonalization, and feeling incompetent. Although the concept of burnout has originally been defined in the context of work-related stress, the traditional concept and scope have recently been broadened to include study-related problems (11). Indeed, research on burnout symptoms among students in higher education is upcoming, showing that burnout symptoms among students seem even more prevalent than among the working population (5,6,12). Burnout symptoms among students are similar to burnout symptoms among professionals, they refer to feelings of exhaustion (because of high study demands), having a cynical and detached attitude toward one's study and experiencing a reduced sense of accomplishment as a student (11).

The development of burnout is explained by Job Demands-Resources model for Burnout and Engagement (JD-R Model). The model assumes that high demands lead to stress reactions and exhaustion, while having many resources (sources of energy), like rewards or social support, leads to higher productivity, which is a motivational process (13,14). Burnout symptoms are a result of insufficient balance between experienced demands and resources (14). Until now, little research has been done regarding the validity of the JD-R model in the student population. While being an unexplored area, the relationship between performance pressure and burnout symptoms is relevant to investigate. The increase of both perceived performance pressure and burnout

symptoms makes it plausible that performance pressure could be a demand that contributes to the development of burnout symptoms among students and therefore could be a predictor of burnout symptoms.

Together with the increase in studies regarding burnout symptoms among students, there is a growing interest in loneliness among students. Loneliness can be defined as *'the subjective experience of an unpleasant or unacceptable lack of (quality of) certain social relationships'* (15). Several studies show that loneliness is a common problem among students and that loneliness and experienced study stress appear to explain depressive symptoms (16). Another study shows that there also appears to be a relationship between loneliness and (lack of) study progress: lonely students experience more stress, are less successful in their final exams and are less involved in their studies (17). An overview study shows loneliness to be related to cardiovascular diseases, the functioning of the immune system, premature death, fatigue, depression and anxiety (18). Both loneliness and burnout are related to negative psychological health. The relationship between these concepts was investigated by Lin and Huang among a sample of Taiwanese university students and by Stoliker and Lafreniere among a sample of Canadian undergraduate students. These studies show that there's a relationship between loneliness and burnout symptoms among students (1,19) and that loneliness is also a predictor of students' engagement in their studies (1). According to Ponzetti (20), students with feelings of loneliness may also be experiencing increased levels of social detachment, which is one of the dimensions of burnout, called *depersonalization* in the JD-R Model. Given the results of these previous studies, it is likely that loneliness plays a role in the development of burnout symptoms. It's likely that the absence of loneliness can be seen a resource.

The other related concept to study resources is sense of belonging, which refers to *'feelings of safety and comfort that arise from the idea of being part of a community, organization or institution'* (21). The most important dimensions of sense of belonging are the feeling of being appreciated and the feeling of fitting within the group. Sense of belonging is a widely studied concept within the educational setting, primarily focused on the relationship with academic performance and motivation. It is seen as an important condition for learning, since learning is generally not considered as an individual, but social process that takes place through collaboration. Students with a higher sense of belonging are more motivated, more committed to their studies and have a greater intention to continue studying (22–25). On a smaller scale, research has been done regarding the relationship between sense of belonging and mental health of students. A higher sense of belonging was found to be associated with fewer study

problems and fewer depression symptoms (26), where another study shows that a lower sense of belonging explained the significantly higher degree of psychosocial problems experienced by children of immigrants, who were the first to go to university (27). Although little research has been done regarding the relationship between sense of belonging and burnout symptoms, a Norwegian study shows a negative relationship between sense of belonging and one of the dimensions of burnout, *exhaustion* (28).

For a long time, the concepts of loneliness and sense of belonging were seen as two sides of the same coin, as a result of which they've rarely been investigated together. Although both concepts stem from the need for connectedness, they differ from each other. Loneliness arises from a discrepancy between the desired and the perceived connectedness with others, which depends on someone's expectations of friendship or intimate relationships and what they deliver. Sense of belonging depends on the degree of being involved and valued on the one hand, and on the other having the feeling of fitting into a system or environment. Relationships are part of that, but not the only thing that makes someone feel fitting in (21). Another difference is that sense of belonging is context specific and loneliness is not (21). Because burnout is also context specific and the feeling of fitting into a school environment could be a resource that is more comprehensive than just the satisfaction about social relationships, sense of belonging is likely to be a resource and may be a specific and important protective factor for burnout symptoms.

It is clear that studies show that burnout symptoms have severe consequences for students, what makes it of great importance to gain insight into the factors that are related to the development of these symptoms and the key principles that can contribute to its prevention. Although several studies have shown that there are indications that performance pressure, loneliness and sense of belonging are predictive of burnout symptoms in general, little is known about what predicts burnout among students. The main aim of this study is to examine if there is a relationship between performance pressure, loneliness and sense of belonging on the one hand and the three dimensions of burnout (i.e., emotional exhaustion, depersonalization and reduced sense of personal accomplishment) on the other hand among students in higher education.

MATERIALS AND METHODS

Procedure

Cross-sectional data were used from the Study environment, Health and Study Success online survey, carried out between December 2017 and March 2018 in a large

university of applied sciences in the Netherlands. Fulltime students were invited by email (*N*=18,163). They were informed upfront about the objective and procedure of the study and participated voluntarily. The consent of the participants was obtained by virtue of survey completion.

Measures

Outcomes

Burnout was assessed with the validated Dutch version of the Maslach Burnout Inventory General Survey (MBI-GS), the Utrecht Burnout Scale General Version (UBOS-A) (29), that was adapted for use in our student sample. For instance, the item *"I feel mentally drained from my job"* was rephrased in *"I feel mentally drained from my studies"*. The UBOS-A questionnaire consists of 15 items that constitute 3 subscales (or dimensions) that together measure burnout symptoms: Emotional Exhaustion (EE; Cronbach's alpha .87 in the present study), Depersonalization (DP; Cronbach's alpha .87 in the present study) and a reduced sense of Personal Accomplishment (PA; Cronbach's alpha.73 in the present study, obtained by removal of the item *"I just want to do my studies and not be bothered"*, which made the alpha considerably higher, i.e., from .60 to .73). All 14 items are scored on a 7-point Likert scale from 1 (*never*) to 7 (*always*). The average scale scores of the three UBOS-A scales are calculated by adding up the scores and dividing by the number of items in the scale of question. High scores on Emotional Exhaustion (EE, mean score ≥2.39) and Depersonalization (DP, mean score ≥ 2.25) and low scores on Personal Accomplishment (PA, mean score ≤.49) are indicative for burnout (7).

Predictors

Performance pressure was assessed with the question: *'To what extent do you feel that you have to perform or achieve?'* The item was scored on a 5-point Likert scale from 1 (*never*) to 5 (*very often*). The higher the score, the more performance pressure was experienced. This scale yielded an average of 2.85 (*SD*=.88).

Loneliness was assessed with the De Jong Gierveld Loneliness Scale with a Cronbach's alpha of .93 in the present study (15). This scale consists of the emotional loneliness subscale (5 items) and the social loneliness subscale (6 items) which together measure loneliness. An example from the emotional loneliness subscale is: *"I experience a general sense of emptiness"* and an example of the social loneliness subscale is: *"There are plenty of people I can rely on when I have problems"*. All items were scored from 1 (*Yes! Totally agree*) to 5 (*No! Totally disagree*). First, the emotional loneliness score is computed by counting all neutral and positive answers on the negatively formulated

items and second, the social loneliness score is computed by counting all neutral and negative answers on positively formulated items. The total loneliness score (0 to 11) is computed by taken the sum of the emotional loneliness score and the social loneliness score. This scale yielded an average of 23.41 (*SD*=8.29) and a Cronbach's alpha of .93 in the present study.

Sense of belonging was assessed by the Sense of Belonging questionnaire (24), consisting of 6 items, for example: *"I feel at home at this university of applied sciences."* All items are rated on a 5-point Likert scale from 1 (*not true at all*) to 5 (*completely true*). An average score of the items was calculated for each participant. The higher the total score, the more the respondent experienced a sense of belonging. This scale yielded an average of 3.81 (*SD*=.60) and a Cronbach's alpha of .77 in the present study.

Covariates

Covariates *age*, *year of study* and *gender* were obtained from data of the Student Administration of the university. *Age* was expressed in years, and *gender* was coded dichotomously (1=*female*, 2=*male*). The students' *year of study* was either *1st year* (=1), *2nd year* (=2), *3rd* year (=3), *4th* year (=4) or *higher than 4th year* (=5). Living situation was assessed as a self-reported item and was also coded dichotomously (1=*living independently*, 2=*living with parents*).

Statistical analysis

Sociodemographic characteristics and descriptive values for all variables were calculated using IBM SPSS Statistics, version 23 (30). Path analysis using Muthén and Muthén's (1998-2011) software MPLUS version 8.0 (31), was used to test the predictive role of performance pressure, sense of belonging and loneliness in burnout symptoms. All three predictors in the model, i.e. emotional exhaustion, depersonalization and (lack of) personal accomplishment, which together predict burnout symptoms, were analyzed together to control for their shared variance in burnout symptoms. Main effects were analyzed while controlling for demographic covariates (age, gender, living situation and year of study).

Maximum likelihood with robust standard error (MLR) was used as estimation method in order to control for possible non-normality's of the data. Preliminary analyses were performed and it was ensured that there were no violations of the assumption of normality, linearity, multicollinearity and homoscedasticity.

RESULTS

A total of 3,141 students completed the "Study Environment, Health and Study Success" survey (response rate 17.3%), 60% of whom were female students (N=1886) and 40% of whom were male students (N=1255) (Table 1). Their average age was 21.8 years old (SD=3.45). Of all students 70.6% were living with their parents and 29.4% were living independently. A total of 28.1% of the participants were freshman (first year) and 71.9% were students in later years. Almost two-third (68.9%) of the participants said that they experienced performance pressure often to very often. Almost half of the participants experienced loneliness (43.3%) and the average score for sense of belonging was 3.81 (SD=.60).

Table 1. Sample characteristics (N=3,141)

Variable	% Participants (or mean with SD)
Gender	
Male	40.0
Female	60.0
Age (*mean, SD*)	
Ethnicity	21.8 (3.45)
Non-Dutch	11.6
Dutch	88.4
Living situation	
Living with parents	70.9
Living independently	29.4
Year of study	
1st	28.1
2nd	21.3
3rd	21.8
4th	18.4
Higher than 4th	10.4
Burnout	
Emotional Exhaustion subscale (*high-very high*)	60.2
Depersonalization subscale (*high-very high*)	34.4
Personal accomplishment scale (*very low-low*)	53.2
Burned out	44.2
Performance pressure	
Often or very often	68.9
Loneliness	
Not	56.7
Moderate to very severe	43.3
Sense of belonging (*mean, SD*)	3.81 (0.60)

Table 2. Emotional Exhaustion, Depersonalization and Personal Accomplishment explained by path analysis (N=3,141)

	Variable	Emotional Exhaustion			Depersonalization			Personal Accomplishment		
		Standardized β	Standard Error	p-value	Standardized β	Standard Error	p-value	Standardized β	Standard Error	p-value
Predictors	Performance pressure	.29	.02	.000	.10	.02	.000	.00	.02	.817
	Loneliness	.19	.02	.000	.12	.02	.000	-.15	.02	.000
	Sense of belonging	-.28	.02	.000	-.47	.02	.000	.23	.02	.000
Confounders	Gender	-.11	.02	.000	.04	.02	.006	.08	.02	.000
	Age	-.07	.02	.000	-.05	.02	.003	.02	.02	.338
	Living situation	.02	.02	.242	-.02	.02	.299	-.02	.02	.445
	Year of study	.07	.02	.000	.21	.02	.000	-.08	.02	.000
		R^2=.288			R^2=.365			R^2=.107		

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Results of the path analysis are shown in Table 2. Performance pressure, loneliness and sense of belonging were significantly associated with the three dimensions of burnout: emotional exhaustion, depersonalization, and personal accomplishment, adjusting for gender, age, living situation and year of study. All these associations reached statistical significance, except one: the association between performance pressure and personal accomplishment.

Emotional exhaustion
Table 2 shows that performance pressure, loneliness and sense of belonging explained 28.8% of the variance in emotional exhaustion, while adjusting for gender, age, living situation and year of study. Performance pressure, loneliness and sense of belonging were all significantly predicting emotional exhaustion independently from each other (all p-values <.01). Background variables that contributed significantly ($p<.05$) to the prediction of emotional exhaustion were gender, age, and year of study. Exhaustion was more present among younger, female students and students that are longer on campus. Living situation did not explain emotional exhaustion significantly.

Depersonalization
Regarding depersonalization, table 2 shows that performance pressure, loneliness and sense of belonging explained 36.5% of its variance, while adjusting for gender, age, living situation and year of study. Performance pressure, loneliness and sense of belonging were all significantly predicting depersonalization independently from each other (all p-values for beta <.01). Comparing the standardized regression coefficients (beta's) shows that sense of belonging (β=-.47) appeared to be the strongest predictor of depersonalization compared to performance pressure (β=.10) and loneliness (β=.12). Background variables that contributed significantly ($p<.05$) to the prediction of depersonalization ($p<.05$) were age, gender and year of study. Living situation did not contribute significantly. Depersonalization was more present among students that were longer on campus.

Personal accomplishment
Regarding (the lack of) Personal Accomplishment, Table 2 shows that performance pressure, loneliness and sense of belonging explained 10.7% of its variance, while adjusting for gender, age, living situation and year of study. Loneliness and sense of belonging were both significantly predicting personal accomplishment independently from each other (all p-values for beta <.01)., Performance pressure did not significantly predict personal accomplishment. Background variables that contributed significantly ($p<.05$) to the prediction of personal accomplishment ($p<.05$) were gender and year of

study. A sense of reduced personal accomplishment was more present among male students and students that were longer on campus. Age and living situation did not contribute significantly.

DISCUSSION AND CONCLUSIONS

Key results

Our results show that performance pressure, loneliness and sense of belonging are significant predictors of burnout symptoms among students, especially of the facets relating to emotional exhaustion and depersonalization. Sense of belonging appeared to be the strongest predictor of all burnout symptoms. Our results are in line with the JD-R model, explaining that burnout symptoms are caused by an imbalance between demands and resources, where high demands lead to emotional exhaustion and low resources ensure depersonalization (14).

A study by Maslach, Schaufeli & Leiter (10) shows that work pressure plays an important role in the development of burnout symptoms. Jacobs & Dodd (32) show that this also applies to performance pressure among students, just like in the present study. Both studies show that performance pressure is most strongly related to the development of emotional exhaustion and less to depersonalization and personal accomplishment. It is likely that students who experience performance pressure work harder. Eventually, for most students it leads to symptoms of exhaustion, which affects their functioning.

The present study shows that exhaustion and depersonalization were more present among students that are longer on campus and that exhaustion was more present among female students, where depersonalization and a sense of reduced personal accomplishment were more present among male students. This is in line with previous studies according to a meta-analysis by Purvana and Muros (33) that states that women are more likely to report emotional exhaustion and men are more likely to report depersonalization, but these gender differences lay in the close-to-zero effect size range. Our findings regarding the higher presence of exhaustion and depersonalization among students that are longer on campus support findings of a study by Salmela-Aro & Read (34). They state that burnout symptoms increase along with the numbers of years of study. We believe that further study into the issue of gender, age and years on campus differences is necessary.

The appeared predictive value of sense of belonging confirms the important role of the university context in the development of burnout symptoms. Hence, sense of

belonging is mostly about feeling at home at university. Students' sense of belonging increases as they feel a stronger connection with their university and the people there (21). Thus, the feeling of not belonging within the university context increases the risk of emotional exhaustion and depersonalization: symptoms of burnout. Loneliness appeared to be a weaker predictor of burnout symptoms than sense of belonging was. Loneliness can arise without being related to the study context. This could explain why students can report low levels of sense of belonging and high level of burnout symptoms in their studies, while not reporting loneliness.

In addition to previous findings of Bakker, Demerouti, & Euwema (35), the present study also shows a relationship between resources and emotional exhaustion. Sense of belonging and social support appear to be important resources here that provide energy and reduce the chance of getting emotional exhausted. Possibly, when students feel connected to the study program and at the same time feel supported during this program, study tasks cost less energy and exhaustion, therefore burnout symptoms, are prevented.

Limitations

The measurement of performance pressure is debatable. Because performance pressure among students is a fairly new concept, no reliable and valid questionnaire was available. This also might have led to limitations regarding the estimation of perceived performance pressure in students. However, our findings were in line with previous studies that are firmly rooted in the theory of the JD-R model.

Furthermore, because cross-sectional data were used, causal interpretations require caution. Students' experiences are subject to change over time. As a result, it is unknown how burnout symptoms develop over time. Longitudinal data are needed to confirm that students' experiences predict burnout and that changes in students' experiences predict changes in burnout levels. Future studies should also focus on the occurrence and consequences of burnout and performance pressure among a broader sample of several universities, based on a new definition of both burnout and performance pressure specifically for students.

Finally, the results of the present study are based on a Dutch sample. An advantage of the present study is the large sample that was found to be representative for the total population of the university where the study was conducted in terms of the mean age and distribution of students' gender, faculties and year of study, which contributes to validated conclusions. The extent to which burnout symptoms exist may differ

between universities, however, there's no reason to assume that the associations found in the present study will differ greatly between universities.

Implications and conclusions

This study highlights the importance of including sense of belonging, loneliness and performance pressure in future studies of student burnout. There's a need for a better understanding of what underlies performance pressure, loneliness and burnout and how we can adequately address these factors. There are indications that performance pressure, loneliness and burnout symptoms are not only rooted within the educational environment, but also in a broader societal context (2,3). In order to address these problems efficiently, it is important to examine the origin of performance pressure, loneliness and burnout symptoms and the factors that may be of influence within the educational setting thoroughly.

Our findings show that performance pressure as a demand, and (the absence of) loneliness and sense of belonging as resources, predict burnout symptoms in students. Performance pressure, as one of the greatest concerns of this time regarding student wellbeing, is strongly associated with mainly emotional exhaustion, but also with depersonalization. Performance pressure can therefore be seen as an important demand during student life. There is a need to examine the association between performance pressure, loneliness and burnout symptoms on the one hand and academic performance on the other hand in more extended longitudinal studies, with a starting point in the first year when students have no academic experience yet.

Our findings increase the understanding of burnout development among students from a more contextual perspective. They show the importance of the study environment as protective factor for the development of burnout symptoms. A lack of sense of belonging showed the highest, significantly increased risk for all three dimensions of burnout. Therefore, sense of belonging appears to be essential as a resource that leads to the prevention of burnout symptoms. This is not surprising, since the association between sense of belonging and positive mental health is well demonstrated (27). Several studies suggest that sense of belonging is a significant predictor of both academic success and student mental health (36–39). Students who report a high sense of belonging adjust better to university life (38) and report lower levels of depression and loneliness (37). Bakker, Hakanen, Demerouti, & Xanthopoulou (40) found that resources like social support and appreciation enhance the sense of belonging and mitigate the negative effect of high performance pressure. We therefore suggest to make sense of belonging a priority in the enhancement of student

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wellbeing, as this resource could improve the ability of coping with the high demands in student life. What happens to student wellbeing and academic performance if you enhance resources like social support and a supportive study environment? With a better understanding of both the course and consequences of burnout and possible other psychosocial problems and protective factors that make prevention of these problems possible, we will be able to promote the wellbeing and student success of students in higher education.

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CHAPTER 3

The use of the Alcohol Use Disorders Identification Test-Consumption as an indicator of hazardous alcohol use among university students

ABSTRACT

Background: Hazardous drinking among students in higher education is a growing concern. The AUDIT is the gold standard screening instrument for hazardous drinking in the adult population, for which an abbreviated version has been developed: the AUDIT-C. Currently there's no gold standard for identifying hazardous drinking among students in higher education and little evidence regarding the concurrent validity of the AUDIT-C as a screening instrument for this group. This study investigated the concurrent validity of the AUDIT-C in a sample of university students, and suggests the most appropriate cut-off points. *Methods:* Cross-sectional data of health-surveys from 5,401 university and university of applied sciences in the Netherlands were used. ROC curves, sensitivity, specificity, positive and negative predictive values for different cut-off scores of AUDIT-C were calculated for the total sample and for subgroups stratified by age, gender and educational level. AUDIT-score ≥11 was used as the criterion of hazardous and harmful drinking. *Results:* 20% of students were hazardous and harmful drinkers. The area under the ROC curve was 0.922 (95%CI:0.914-0.930). At an AUDIT-C cut-off score of ≥7 sensitivity and specificity were both >80%, while other cut-offs showed less balanced results. A cut-off of ≥8 performed better among males, but for other subgroups ≥7 was most suitable.

Conclusion: AUDIT-C seems valid in identifying hazardous and harmful drinking students, with suggested optimal cut-offs seven (females) or eight (males). However, considerations regarding avoiding false-positives vs. false-negatives, in relation to the type of intervention following screening, could lead to selecting different cut-offs.

INTRODUCTION

Students drink more than their peers who are not attending higher education [1–3] and alcohol use is the leading cause of injury and death among students [4,5]. Especially binge drinking (drinking 5 or more drinks in one occasion) is a highly prevalent risk behavior [6] that increases students' short-term risk of poor academic performance [7] and college drop-out [8], and their long-term risk of alcohol dependence and learning and memory impairments [7–10].

In Europe, the continent with the highest per capita alcohol consumption, hazardous alcohol use is very prevalent among students [11,12]. In the Netherlands (where this study took place), 24 percent of students between 18 and 24 are hazardous drinkers. Hazardous drinking is defined as men consuming 6 or more, and women 4 or more, glasses of alcohol at least once a week [13]. This is much higher than in the general adult population, where 10 percent are hazardous drinkers [14].

Due to the societal acceptance of high levels of alcohol use as part of student culture, hazardous student drinking is often down-played [14,15]. This might partly be driven by the idea that many students show natural recovery of hazardous drinking after a typical peak of drinking at a younger age, often without specific treatment [16-19]. However, because hazardous drinking is associated with short-term risk of poor academic performance, college drop-out and long-term risk of alcohol use disorder (AUD), there is a need to identify hazardously drinking students in order to refer them to primarily, further alcohol assessments and secondarily, if needed, appropriate interventions. The societal acceptance on students' drinking behaviors impedes the identification of hazardous drinking students especially those being at risk of AUD and furthermore and most important, current screening instruments and cut-offs seem to do so too. These instruments cause an overestimation of students who seem to be at risk for AUD, which is probably the result of the high prevalence of binge drinking among students, based on which they quickly exceed the cut-off of hazardous drinking. Even though binge drinking is risky behavior that we want to identify, it is not enough to base hazardous drinking and being at risk for AUD on. However, there is no gold standard for a valid screening of hazardous alcohol use among students in higher education. Having an assessment instrument to identify these students by measuring prevalence and patterns of risk, enables researchers, practitioners and policymakers [20] to appropriately refer students to further alcohol assessments and interventions.

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Cut-offs of screening instruments for hazardous drinking and being at risk for AUD are derived from the general adult population where hazardous drinking is less frequent than in the student population. Therefore, these screening instruments may identify a higher percentage of hazardously drinking students who are at risk for AUD, than are actually at risk and may need help. This would suggest that cut-offs should be higher in the student population than in the adult population, but there is a lack of information on which cut-off point would most accurately identify students with hazardous drinking behaviors, at risk for AUD.

The ten-item Alcohol Use Disorders Identification Test (AUDIT) [21] has been developed by the World Health Organization (WHO) to identify people with hazardous drinking behaviors and alcohol use disorders [22] and is regarded as the gold standard questionnaire for screening hazardous and harmful drinking in mainly clinical settings for the adult population. The first three questions of the AUDIT, i.e. the AUDIT-Consumption (AUDIT-C), measure the amount and frequency of drinking [22,23]. The second part assesses the frequency of experienced mental and physical problems due to alcohol consumption. According to studies in adults, the AUDIT-C is almost equally accurate in detecting hazardous drinking patterns and being at risk for AUD as the full AUDIT [23,24]. In adults, a score of 4 for men and 3 for women on the AUDIT-C is considered optimal for identifying hazardous drinking or active alcohol use disorders [22] with sensitivity and specificity in the mid-90s and 80s, respectively. Important advantages of using the AUDIT-C instead of the full AUDIT are that the questionnaire is shorter, and the questions are less intrusive. The AUDIT-C may therefore have a lower risk of response bias and reporting bias.

The concurrent validity of the AUDIT-C among students has been evaluated in a limited number of studies, with different outcome measures. In a US study among 18 to 20 year olds, of which 89% were college students, the AUDIT-C performed best with cut-off scores of 6 for men and 5 for women [25] in the prediction of AUD (using DSM-IV criteria), with sensitivity and specificity between 68 and 78%. Another study among US students concluded that a cut-off score of 7 should be used for men and 5 for women in order to detect at-risk drinking (defined by the number of drinks in a typical week and/or the total number of heavy drinking episodes in the past month) [26]. To our knowledge, no such studies, besides the use of the AUDIT-C in the detection of binge drinking [27], were performed in Europe. Results in Europe could be different, due to differences in legislative and cultural context, such as the minimum age of alcohol sales and the standard serving size of alcoholic beverages [28-29].

Given the diversity of student populations, the sensitivity and specificity of screening methods for hazardous alcohol use may not be the same across different subgroups. This diversity may go beyond gender differences. Because of the typical peak in drinking in a younger age [18-19] we will compare different age groups. Furthermore, university is more known for their drinking culture than a university of applied sciences. Therefore, we will also compare groups based on educational level.

We assume that the AUDIT-C provides us with a good screening method for hazardous alcohol use, with higher optimal cut-offs for students than for the general adult population. This may apply to an even larger extent for those subgroups of students that are more frequent drinkers (i.e., men, university students and older students). The aim of this study is to examine the concurrent validity of the AUDIT-C and to examine whether the AUDIT-C is a valid screening instrument for hazardous drinking and being at risk for alcohol use disorder among university students. We therefore examined the sensitivity and specificity of different AUDIT-C cut-off points for hazardous alcohol use, defined with the full AUDIT score. Additionally, we examined the validity for different subgroups of age, gender and educational level (university and university of applied sciences).

MATERIALS AND METHODS

Data collection and study sample

Cross-sectional data was used from the February 2015-May 2016 Student Health Check survey, carried out in a university and a university of applied sciences in Amsterdam [30]. The students were invited for the survey by student advisors and course managers through emails, newsletters and TV-screens on campus. Furthermore, a website specifically developed for this purpose, the www.studenthealthcheck.nl [30] with the self-monitor online is available throughout the whole school year. In addition, cross-sectional data from the December 2012- January 2013 Study environment, Health and Study success survey, carried out in a university of applied sciences in Zwolle, were used. Students were invited by email.

Both surveys were aimed at improving students' recognition of their health problems at an early stage through self-monitoring, and to provide personalized feedback [30]. Participants were extensively informed upfront about the objective and procedure. The participants provided written consent for the use of data.

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Not all students who were invited, completed the survey. For the Student Health Check in Amsterdam (*n*= 5169) the response rate is unknown, as there are multiple recruitment methods that could not be monitored. Only the response rate for the Study environment, Health and Study success in Zwolle could be calculated which amounted to 14.7% (*n* = 2332). A total of 7,501 students completed the questionnaire.

Non-drinkers were defined as those who indicated to never consume alcoholic beverages, and were removed from the sample (*n* = 985; including 77 who had missing values). From the remaining 6,516 students, participants with one or more missing values on AUDIT items (*n* = 136) and for age, gender and/or educational level (*n* = 54) were also excluded. Lastly, 925 participants were excluded because their age exceeded the target age-range (17-25). The final sample included 5,401 respondents.

MEASURES

Alcohol use was measured with the AUDIT-C (Audit questions 1-3) [23]. The questions assessed frequency of drinking, typical number of drinks consumed on a drinking day, and frequency of binge drinking. Responses to each item were scored from 0 to 4. The other 7 AUDIT questions were also asked, to generate the full AUDIT-score [19]. Because of the lack of a gold standard for screening hazardous alcohol use for students, hazardous drinking was measured with reaching or exceeding the recommended (full) AUDIT cut-off of 11 for students by Fleming et al., for adequate sensitivity [31]. Note that this score is higher than for the general population.

Respondents provided demographics including age, gender and educational level. Educational level discriminated students in university from students in the university of applied sciences. Age was classified into two groups: 17 to 21 and 22 to 25, based on the phase in their education (bachelor vs. master). In the Netherlands, students start their bachelor at age 17 or 18, which last for three or four years. After completion of the bachelor, most students continue with a master program of one or two years.

STATISTICAL ANALYSIS

All statistical analyses were performed using SPSS, version 24 [32]. First, sociodemographic characteristics, prevalence of hazardous drinking and mean AUDIT-C scores were described for the total sample and by gender, age and educational level. Next, sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated for each AUDIT-C cut-off score

for the total sample and for the different subgroups. Sensitivity identified the true positive proportion, and specificity the true negative proportion. PPV determined the proportion of students who actually were hazardous drinkers according to the AUDIT out of all students with a score above the AUDIT-C cut-off point (i.e. positive test). NPV determined the proportion of students who actually were non-problematic drinkers according to the AUDIT out of all students with a score below the AUDIT-C cut-off point (i.e. negative test). Receiver operating characteristic (ROC) curve analysis was used to determine the area under the curve (AUC) [33], which represents the accuracy of the test. AUCs higher than 0.80 are generally considered sufficient [34]. The AUC was measured for the total study sample and for the different subgroups. Finally, a sensitivity analysis was undertaken in which we varied the AUDIT cut-off criterion to define hazardous alcohol use to 10 and 12 and compared results with the main analysis.

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RESULTS

Table 1. Characteristics of participants in no. (%) of participants unless otherwise is indicated

	Total sample	Hazardous drinkers*	AUDIT-C score, mean (SD)
Total	5401 (100)	1080 (20)	5.15 (2.47)
Men	1833 (33.9)	588 (32.1)	6.17 (2.53)
Women	3568 (66.1)	492 (13.8)	4.62 (2.26)
Age 17-21	2240 (41.5)	394 (17.6)	5.00 (2.42)
Age 22-25	3161 (58.5)	686 (21.7)	5.25 (2.50)
University of Applied Sciences students	3688 (68.3)	613 (16.6)	4.94 (2.50)
University students	1713 (31.7)	467 (27.3)	5.59 (2.33)

* Percentage of total sample and subgroups, defined AUDIT ≥11.

Table 1 presents hazardous drinking rates and AUDIT-C scores in the total sample, and in subgroups. The mean score on the AUDIT-C for all students was 5.15 (SD = 2.47). Men had the highest mean AUDIT-C score of all subgroups (6.17, SD = 2.53), followed by university students (5.59, SD = 2.33), and older students (5.25, SD = 2.50). A total of 1080 students (20.0%) were identified as hazardous drinkers, based on the AUDIT. The prevalence of hazardous drinking across subgroups shows almost the same pattern as for mean AUDIT-C scores, with relatively high scores among males (32.1%) and students aged 22-25 years (21.7%).

The distribution of participants with positive or negative test results on scores of the AUDIT-C was calculated. Cut-off points 3 to 6 had more participants who scored above (range 99.9%-95.5%) than under the cut-off point (range 0.1%-4.5%). For cut-off points 7 and 8, more participants scored under the cut-off point (12.2% and 30.1%) than above (87.8% and 69.9%). The proportion of hazardous drinkers was substantially higher among those above the AUDIT-C cut-off point than those under the cut-off point, except for cut-off point 9. From cut-off point 9 onwards the distribution reversed.

Table 2. Sensitivity, specificity, PPV and NPV for different cut-off scores AUDIT-C for the total sample (N=5401)

Cut-off score AUDIT-C	Sensitivity	Specificity	PPV	NPV
3	99.9	20.8	24.0	99.0
4	99.6	35.0	27.7	99.7
5	98.4	52.5	34.1	99.3
6	95.5	68.9	43.4	98.4
7	87.8	83.4	56.9	96.5
8	69.2	92.9	70.8	92.3
9	39.9	97.9	82.3	86.6

PPV, positive predictive value; NPV, negative predictive value; AUDIT-C, Alcohol Use Disorders Identification Test-Consumption.

Sensitivity, specificity, PPV and NPV for the total sample for possible cut-off scores of the AUDIT-C are presented in Table 2. The AUC value for the ROC curve was 0.922 (95%CI: 0.914-0.930), representing a high probability that a hazardous drinker has a higher AUDIT-C score than a non-hazardous drinker. Sensitivity was high (>85) for cut-off points 3 to 7, but declined rapidly for cut-off points 8 (69.2) and 9 (39.9). Specificity was low (<65) for cut-off points 3 to 6, and only reached high values (>85) at cut-off points 8 and 9. At cut-off point 7, specificity was moderate (83.4%). For cut-off points 3 to 6, PPV was low (<55), at cut-off point 7 PPV was moderate and for cut-off points 8 and 9 PPV was high. NPV was high for all cut-off points (>85). Overall, a cut-off of 7 showed the most balanced combination of sensitivity and specificity (i.e., for which sensitivity and specificity were acceptably high).

Table 3. Sensitivity, specificity, PPV and NPV in percentages for different cut-off scores AUDIT-C stratified by gender, age and educational level

		Cut-off scores AUDIT-C						
		3	**4**	**5**	**6**	**7**	**8**	**9**
Men (N=1833)	Sensitivity	100.0	100.0	98.8	97.1	92.5	80.8	51.0
	Specificity	13.3	23.8	41.0	57.0	74.9	86.1	94.5
	PPV	35.3	38.3	44.1	51.6	63.6	73.3	81.5
	NPV	100.0	100.0	98.6	97.7	95.5	90.5	80.3
Women (N=3568)	Sensitivity	99.8	99.2	98.0	93.5	82.1	55.3	25.2
	Specificity	23.8	39.6	57.2	73.7	86.8	95.6	99.3
	PPV	17.3	20.8	26.8	36.3	49.8	66.8	84.4
	NPV	99.9	99.7	99.4	98.6	96.8	93.0	89.2
Age 17-21 (N=2240)	Sensitivity	100.0	100.0	98.7	96.7	87.3	68.3	36.3
	Specificity	22.0	35.8	53.5	70.4	84.1	92.9	97.8
	PPV	17.6	24.9	31.1	41.1	53.9	67.3	77.7
	NPV	100.0	100.0	99.5	99.0	96.9	93.2	87.8
Age 22-25 (N=3161)	Sensitivity	99.9	99.4	98.3	94.8	88.0	69.7	41.0
	Specificity	19.9	34.5	52.0	67.8	82.8	92.8	98.0
	PPV	21.7	29.6	36.2	44.9	58.7	73.0	84.9
	NPV	99.8	99.5	99.1	97.9	96.2	91.7	85.7
University of applied sciences students (N=3688)	Sensitivity	100.0	99.7	98.4	95.3	88.6	71.5	45.7
	Specificity	23.1	37.7	55.6	71.3	84.2	92.7	97.4
	PPV	20.6	24.2	30.6	39.8	52.8	66.0	77.8
	NPV	100.0	99.8	99.4	98.7	97.4	94.2	90.0
University students (N=1713)	Sensitivity	99.8	99.6	98.5	95.7	86.7	66.2	30.8
	Specificity	15.2	28.5	44.9	63.1	81.2	93.4	99.1
	PPV	30.6	34.3	40.1	49.3	63.4	79.0	92.9
	NPV	99.5	99.4	98.8	97.5	94.2	88.0	79.3

AUC (95%CI) for Men: 0.908 (0.895-0.922); AUC (95%CI) for Women: 0.918 (0.906-0.929)
AUC (95%CI) for Age 17-21: 0.924 (0.912-0.937); AUC (95%CI) for Age 22-25: 0.920 (0.910-0.931)
AUC (95%CI) for Higher vocational students: 0.928 (0.919-0.938); AUC (95%CI) for University students: 0.912 (0.897-0.926)
PPV, positive predictive value; NPV, negative predictive value; AUDIT-C, Alcohol Use Disorders Identification Test-Consumption, AUC, area under the curve.

Table 3 shows the sensitivity, specificity, PPV and NPV of different cut-off points of the AUDIT-C, stratified by gender, age and educational level. The AUC was high for all subgroups (>0.9), indicating a good performance of the AUDIT-C. Sensitivity, specificity, PPV and NPV showed the same pattern for the subgroups as for the total sample. However, sensitivity decreased more rapidly in women than in men, whereas specificity increased more rapidly. Students aged 22-25 and university students had

a higher PPV than students aged 17-21 and higher vocational students, respectively. Results suggest a different optimal cut-off point for men (8) than for women (7), when sensitivity and specificity are most balanced. For various age and educational level subgroups, 7 seems the optimal cut-off point.

Table 4. Sensitivity analysis (N=5401)

Cut-off point AUDIT-C	Cut-off point AUDIT	Sensitivity	Specificity	PPV	NPV
	10	93.7	72.9	53.9	97.2
6	11	95.5	68.9	43.4	98.4
	12	96.4	66.0	34.9	99.0
	10	84.0	87.1	68.7	94.1
7	11	87.8	83.4	56.9	96.5
	12	90.5	80.4	46.7	97.8
	10	63.6	95.4	82.3	88.6
8	11	69.2	92.9	70.8	92.3
	12	74.9	90.9	61.0	95.0

AUDIT, Alcohol Use Disorders Identification Test; AUDIT-C, Alcohol Use Disorders Identification Test-Consumption; PPV, positive predictive value; NPV, negative predictive value.

In a sensitivity analysis as shown in table 4, the analysis was repeated with hazardous drinking defined by two alternative cut-off scores for the AUDIT; 10 and 12 respectively. The values of sensitivity, specificity and NPV slightly changed, with a maximum change of 5%. The PPV changed more, with a maximum of 10%. This is due to the change of the prevalence of hazardous drinkers at different cut-off scores of the AUDIT.

DISCUSSION/CONCLUSION

Key results

The ROC results imply that the AUDIT-C is a valid test to identify hazardous drinking in the student population, as defined by the full AUDIT. Sensitivity and specificity outcomes were in balance and simultaneously high (>80%) at cut-off point 7 for the total sample. The PPV was low (<50%) for cut-off points 3 to 6 and increased with cut-off points 7 to 9. The NPV was high (>85%) for all cut-off points. These patterns were similar for groups of different ages and educational levels, but not for gender. The most balanced cut-off point was higher in males (8) compared to females (7).

Comparison with previous studies

Our findings are largely in agreement with those observed in two US studies, examining the use of the AUDIT-C in a student population [25,26]. These two studies

found AUCs of 0.83 and 0.89, respectively, which is comparable with our findings. Their recommended cut-off scores of respectively 5 and 6 are lower than our most balanced combination of sensitivity and specificity at cut-off 7. Differences in cut-off scores might be due to standard drinks being smaller in Europe (10 grams in the Netherlands) compared to the US (14 grams). Furthermore, lower cut-off scores in the US might be explained by other legislation in Europe compared to the US with regard to the age limit of alcohol consumption.

In addition, Kelly et al. [25] also found a higher AUC for women than for men and a higher cut-off score for men (6) was recommended compared to women (5). DeMartini and Carey [26] also proposed a higher cut-off score in men (7) than for women (5).

Another study examining the validity of the AUDIT-C for at-risk drinking among students recommended a cut-off score of 5 for women and 7 for males [35], whereby at-risk drinking was defined as 14 or more drinks per week for males and 7 or more drinks per week for females. This is slightly lower than the recommended cut-off scores in our study, which could again be due to other legislation in the US compared to Europe.

A study conducted in Sweden [36] examined the ability of the AUDIT-C to discriminate between a group of problem drinkers and non-problem drinkers, whereby problem drinking was defined as a treatment seeking population and the general population comprised the non-problem drinkers. They found an optimal cut-off point of 6 with an AUC of 0.60 and 0.32 and 0.92 sensitivity and specificity, respectively. The optimal cut-off point and AUC are lower than in our study, which might be due to the difference in definition of problem drinking between both studies.

A review reported that the AUDIT-C performs almost equally well as the full AUDIT in predicting alcohol use problems and AUD [37]. This review also recommended separate cut-offs for men and women when using the AUDIT-C. The recommended cut-off score for detecting hazardous drinking is 4 for men and 3 for women. However, of the 15 studies examined in the review, none used a college sample, and hazardous drinking was defined in various ways. Furthermore, most studies were conducted among primary care patients or participants with mood or anxiety disorders. Therefore, the findings of this review are not comparable to the findings in our study.

Implications

The results showed that the AUDIT-C cut-off score of 4 (proposed for the general population by Saunders et al. [22] will lead to many false-positives in (Dutch or European) university students. Based on our findings, we recommend cut-offs of 8 for male and 7 for female students. The AUDIT-C is intended to determine eligibility of students for further alcohol assessments, but if needed, students can be referred to targeted interventions as a result of these assessments.

Regarding interventions, the choice of the cut-off points depends on the country (and related size of standard drinks) and the need to avoid either false-positives or false-negatives. This may depend on the selected intervention.

For interventions that require a lot of time and resources, such as counseling at the student psychologist, false-positives need to be avoided. In this case, it may be more important to prevent wasting limited time and resources by using a screener with high specificity. A possible disadvantage is that many hazardous drinkers could be missed due to the lower sensitivity. This may, however, be acceptable, because 1) hazardous drinking is not immediately life-threatening, and 2) for many students, heavy alcohol use and alcohol dependence in adolescence and early adulthood will tend to decline at older ages [38]. From our results, cut-off scores of 8 in females and 9 in males seem most suitable when screening students for interventions with high costs and resources.

The avoidance of false-negatives may be preferred for interventions with low cost and little personal effort. These interventions may take different forms, from merely providing information on the risks of hazardous drinking, to personalized online advice, and self-guided online interventions. Self-guided online interventions based on integrated therapeutic principles have been demonstrated to be effective in both community and health care settings, and to be more effective than online interventions based on personalized normative feedback alone [39]. In this scenario, high sensitivity may be strived for. Although there will be more false-positives, providing some non-hazardous drinkers with advice and information to lower their alcohol consumption is not harmful. From our findings, a cut-off score of 7 in females and 8 in males may be most suitable when positively screened students are referred to an intervention with low costs and limited resources.

The health care cost for alcohol use disorders are high and most interventions are cost-effective [40]. However, a low cut-off will result in more false-positives (i.e. identifying

non-problematic drinkers as problematic drinkers), who will increase the costs of the intervention, but not the effects. Moreover, false positives may undermine the confidence of professionals in the screening instrument. Therefore, cost-effective interventions become ineffective when the threshold for referring individuals to the intervention is too low. Hence, for interventions that require a lot of time and resources, false-positives need to be avoided. For interventions with low costs and resources, the avoidance of false-positives is less necessary as the extra effects might be higher than the extra costs.

Limitations

This study has several limitations. First, the information on alcohol consumption is based on self-reports, which is generally found to be accurate, under specific conditions. Although studies showed that self-reported alcohol consumption levels and problems may stay under-reported due to socially desirable answering of questions [41,42], other studies showed that problematic drinkers' self-reports are generally valid across different cultures and ethnicities [43], especially when conducted in a research setting and participants were given assurances of confidentiality [44]. Collected data in the present study were processed anonymously, which was explicitly stated to the participants.

Second, participation in surveys might be selective. Not all students who were invited, completed the survey. For the Student Health Check in Amsterdam the total invited sample size is unknown, as there were multiple recruitment methods that could not be monitored. Only the response rate for Zwolle could be calculated. Although the respondents were similar in their basic characteristics (i.e. age, gender, academic year, faculty) compared to the general student population, the low response rate may affect reliability and validity of the study. In general, healthier people are more willing to cooperate in health research than unhealthy people [45]. This might lead to an underestimation of the proportion of hazardous drinkers and an underestimation of the alcohol consumption level. As a result, the PPV may be underestimated. Furthermore, the results are based on a Dutch sample, so it remains unclear to what extent they translate to other student samples, although we expect generalizability to countries with similar student cultures (e.g. many other European countries). Moreover, the data from the two different cohorts were collected in two different time periods, 2012/2013 and 2015/2016. However, we do not expect large differences in drinking behavior between these two periods, as the interval between them is small.

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Third, the use of short scales has been advocated [46,47]. Several studies discussed the challenges and caveats of short scales. Although they do not oppose the use of these scales, they do assert that the validity standards for short scales should be very high [46], in particular in clinical settings. It's important to strike a balance between maximizing the construct coverage (as in long scales) and the efficiency of measurement (as in short scales) [47]. According to Shrout et al. [48] *"it may be possible to use shortened versions of established screening scales for case identification and prevalence estimation without undue cost in terms of sensitivity and specificity of the screen."* This current study aimed to contribute to suggesting a specific cut-off for hazardous student drinking and makes a cautious step in that direction. Further research elaborating on this study and its proposed cut-offs is recommended.

Fourth, the gold standard for validating a screener is to use a validated clinical interview as outcome measure, which was not possible in our study.

Finally, future research may apply different statistical analyses which allow testing the extent to which the optimal AUDIT-C cut-off scores differ between subgroups and examine whether introducing more narrow subgroups that combine multiple risk factors for hazardous drinking leads to higher diagnostic validity.

CONCLUSION

Considering concurrent validity, the AUDIT-C performed well and has good potential as screener to identify hazardous drinking students at risk for alcohol use disorder. The AUDIT-C also has clear advantages because of its brevity. A general cut-off score of 7 provided the most balanced combination of sensitivity and specificity for European students, or 7 (females) and 8 (males), when gender-specific cut-offs are used. We recommend that the AUDIT-C is primarily intended to determine students who are eligible for further alcohol assessments and, secondarily, targeted interventions. A cut-off higher or lower than 7 may be selected, when the importance of avoiding false-positives vs. false-negatives needs to be considered in light of the preventive action that is undertaken with those identified as hazardous drinkers, at risk for alcohol use disorder.

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CHAPTER 4

Predicting the risk of academic delay and dropout for students in higher education based on personality profiles and psychosocial problems

ABSTRACT

Academic delay and dropout are major problems among students in higher education. It is a growing concern that many students experience psychosocial problems. Although the cross-sectional correlation between students' problems and academic delay and dropout is well established, less is known about longitudinal relationships. In this study, a prediction model for delay and dropout was developed based on freshmen data and was validated with data of a second cohort. We found age and anxiety sensitivity at baseline to contribute to the prediction of delay. However, the contribution of these variables was too small to predict which freshmen students would ultimately experience delay. With respect to dropout, we found that gender, hopelessness, and anxiety sensitivity at baseline contributed to the prediction of dropout, with, 64.4% of the drop-outs being correctly classified. Our findings suggest that, as a result of a complex nature and interplay of risk factors that may contribute, delay and dropout are not easily predicted based on freshmen problems and solely personality profiles. Future research may add other personal characteristics, psychosocial problems and protective factors like resilience. Nevertheless cautious recommendations are made to universities to use screenings for early identification of at-risk students and to test brief symptom-oriented or risk-factor oriented (e.g., personality-based) interventions, that may promote students' mental health and subsequently delay and dropout.

INTRODUCTION

Academic delay and dropout are important problems among students in higher education, given the psychosocial and financial consequences for the individual student involved and the (financial) consequences for the educational institutions and society (Lassibille & Gómez 2008a). In the Netherlands, where this study took place, these problems have triggered several policy changes and intervention approaches in higher education, including a stricter selection at admission and a binding recommendation of (dis)continuation[2].

Although university life, with all new experiences and challenges, is often referred to as a very positive period in life (especially in the retrospective accounts of successful ex-students), research in current students has demonstrated that in fact, it is experienced by many as a difficult time (Stoliker & Lafreniere 2012). There may be risk signs for delay and dropout the study program that needs to be focused on. Prior to withdraw and dropping out, many students report becoming alienated from their schools, with many reporting psychosocial problems (Entwisle, Alexander, & Olson 2005). The mental health of university students has been the subject of an increasing number of studies during recent years (Auerbach et al., 2016). Several studies have shown that students experience loneliness, high levels of stress (Auerbach et al. 2016; Newcomb-Anjo, Villemaire-Krajden, Takefman, & Barker 2017; Tosevski et al. 2010) and that burnout symptoms have become a common problem among students in higher education (Dyrbye et al. 2008; Ishak et al. 2013; Reyes et al. 2016; Stoliker & Lafreniere 2012).

It is known that many students experiment with alcohol. Most of them begin to use alcohol as means to goals like social acceptance and fitting in (Köpetz, Lejuez, Wiers, & Kruglanski 2013; Köpetz & Orehek 2015), but some students that start experimenting with alcohol become addicts. For them alcohol use can become a goal in itself that is pursued in the absence of the original motivation (Köpetz & Orehek 2015). Addictive behavior is one of the most common forms of psychopathology among adolescents and young adults (especially in young men) and it often leads to other forms of psychopathology, e.g., depression and anxiety (De Graaf, Ten Have, Van Gool, & Van Dorsselaer 2012; De Graaf, Tuithof, & Dorsselaer 2012; Jackson, O'Neill,

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2   The European Credit Transfer and Accumulation System (ECTS) is a tool of the European Higher Education Area for making studies and courses more transparent. 60 ECTS credits are the equivalent of a full year of study. The school determines the threshold value that must be achieved at the end of the first academic year in order to continue the study after the first year. The corresponding advice is called the binding recommendation of continuation. If this recommendation is negative, the student is obliged to quit the study.

& Sher 2006; Jackson, Sher, Gotham, & Wood 2001). Regarding alcohol use among students and effects on academic performance, research shows high hazardous drinking rates among students and strong support for the college effect of drinking (Peeters, Oldehinkel, Veenstra, & Vollebergh 2019; Verhoog et al. 2019). It is known that students drink more than their peers who are not attending higher education (Dawson, Grant, Stinson, & Chou 2004; Kypri, Cronin, & Wright 2005) and that especially binge-drinking (drinking 5 or more drinks in one occasion) is a highly prevalent risk behavior that seems to increase students' risk for poor academic performance and dropout (Jennison 2004; Townshend & Duka 2005; Wechsler & Nelson 2001).

For a number of students, pre-existing psychosocial problems may persist or worsen during the course of their studies, while others develop psychosocial problems for the first time (McLafferty et al. 2017). Both can have an impact on academic performance (McLafferty et al. 2017; Zivin, Eisenberg, Gollust, & Golberstein 2009) and there is also evidence for the converse: students with problems in academic life are at higher risk for mental health problems and suicide (Tosevski et al. 2010). Newcomb-Anjo et al. (2017) suggest that symptoms of anxiety and depression experienced by university students are related to greater perceived stress associated with academic workload, feeling less dedicated to their studies, and feeling lonely within the university context. In some cases, this may even lead to suicidal ideation (Tosevski et al. 2010).

Whether or not students experience more psychosocial problems compared to their non-studying peers, research clearly shows that many students are having difficulties in dealing with experienced pressure (e.g. school, peers) and several symptoms of psychological distress, which is likely to cause problems in educational attainment. Identifying students who are likely to delay or withdraw as a result of psychosocial problems is important in the development of retention strategies (Lassibille & Gómez 2008a). Therefore, it is crucial to gain more insight into which psychosocial problems and student characteristics contribute to the likelihood of delay and dropout.

Research indicates that gender and age are significant predictors of students' ability to adjust to university (Cabras & Mondo 2018; Lassibille & Gómez 2008b). Generally, males adjust faster than females (Enochs & Roland 2006; Yau & Cheng 2014). Furthermore, studies have shown over the years that personality is an important predictor of academic achievement in post-secondary education (Kappe & Van Der Flier 2012a). Based on research on several extensive personality questionnaires, the Substance Use Risk Profile Scale (SURPS) brief personality scale was designed to assess four dimensions of personality: impulsivity, sensation seeking, hopelessness and anxiety sensitivity

(Woicik, Stewart, Pihl, & Conrod 2009a). The content of the items of the SURPS were derived conceptually from established personality scales that assess the more broader concept of personality. Although the scale originally was aimed at assessing substance abuse vulnerability, it is currently also used as a broader risk personality screener for psychopathology among adolescents, such as the most common mental health disorders anxiety and depression, of which several studies have shown that they are associated with the personality dimensions of the SURPS (Henges & Marczinski 2012; Krank et al. 2011; Malmberg et al. 2010a; Pulkkinen & Pitkanen 1994; Sher, Bartholow, & Wood 2000; Woicik et al. 2009a).

Impulsivity involves difficulties in the regulation of behavioral responses, sensitivity for rewards and a lack of attention for the consequences of these behaviors. Sensation seeking concerns the need for new and intense sensations and experiences, and the willingness to take physical and social risks for the sake of such sensations and experiences (Cservenka, Herting, Seghete, Hudson, & Nagel 2013; Zuckerman & Neeb 1979). Hopelessness is defined as a symptom originating from negative experiences and perceptions of helplessness related to the future and is a significant factor in the development of depression and anxiety (Gulec Oyekcin, Sahin, & Aldemir 2017; Hope & Henderson 2014a; Nyer et al. 2013). Anxiety sensitivity, 'the fear of anxiety', is a trait-like fear of anxiety-related bodily sensations due to an individual's belief that experiencing anxiety will lead to harmful psychological, physical, and social consequences and is a risk factor for the development of anxiety, panic, depression and even suicide (Bardeen, Fergus, & Orcutt 2014; Ebbert et al. 2018; Reiss & McNally 1985; Timpano, Carbonella, Keough, Abramowitz, & Schmidt 2015).

Both impulsivity, sensation seeking and anxiety sensitivity are related to an increased risk for alcohol and substance misuse (Conrod, Castellanos, & Mackie 2008; Malmberg et al. 2010b; Peeters, Monshouwer, Janssen, Wiers, Vollebergh 2014; Sher et al. 2000; Whiteside & Lynam 2003). Studies show that anxiety sensitivity seems to become a more important factor of alcohol and substance misuse at later stages of development (Castellanos-Ryan, O'Leary-Barrett, Sully, & Conrod 2013; Krank et al. 2011; Peeters et al 2014). In early adolescence anxiety sensitivity contributes to delayed experimenting with alcohol use, likely due to avoidance of drunkenness to not appear foolish, whereas in later adolescence and young adulthood most likely coping and conformity motives for alcohol use become more important, which increases the risk for substance misuse (Krank et al. 2011). The fear of anxiety often leads to avoidance (Reiss 1991), due to which individuals with elevated anxiety sensitivity are likely to procrastinate and avoid feared anxiety reactions (Chen & Chang 2016; Dahlin & Runeson 2007; Schmidt, Buckner,

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& Keough 2007). Whereas numerous studies found a negative correlation between anxiety and hopelessness on the one hand and academic success on the other hand, some studies found that anxiety sensitivity had a positive impact on academic success of students, likely as a result of greater preparation and perseverance, the desire for better outcome and fulfillment of societal expectations (Gulec Oyekcin et al. 2017; Zalihić, Mešukić, Sušac, Knezović, & Martinac 2017).

Another student characteristic that seems to contribute to academic delay and dropout is self-esteem; studies report that students' self-esteem is negatively affected by stress during their studies (Edwards, Burnard, Bennett, & Hebden 2010; Phan & Ngu 2014). Zhang et al. (2018) found that self-esteem, mediated by fear of failure, was negatively associated with academic procrastination, which is likely to contribute to delay and drop-out. Many studies suggest that low self-esteem is an important vulnerability factor for the development of depression, i.e., low self-esteem is associated with internalizing problems like depressive symptoms and hopelessness; this effect occurred in men as well as women (Lerner, Lerner, De Stefanis, & Apfel 2001; Masselink, Van Roekel, & Oldehinkel 2018).

The association between personality profiles, psychosocial problems and delay and dropout are, thus, well studied in cross-sectional research. However, less is known about the longitudinal associations between freshmen personality profiles and psychosocial problems and study delay and dropout . Longitudinal studies can contribute to a prediction model for academic delay and dropout, bringing us closer to identifying at risk students. Such a prediction model enables the early recognition of risk factors for delay and dropout and may thereby lead to their prevention and thus prevention of high costs and worsening of problems. In order to contribute to these insights and possible solutions the purpose of this study was to examine predictors of academic delay and dropout among students in higher education from personality profiles and psychosocial problems in a longitudinal study. In this study, databases of two cohorts were used. Data of the first cohort was used to develop a prediction model, and data of the second cohort was used to validate the model. The impact of age and gender differences on delay and drop-out were also considered in the present study.

METHODS

Participants and procedure

Data were used from two waves of the Study Environment, Health and Study Success online survey in a large university of applied sciences in the Netherlands. Each wave

consisted of fulltime students of all years of study (2014 cohort, *n*=2222; 2015 cohort, *n*=1324). We selected the freshmen of the 2014 cohort (*n*=962) and the 2015 cohort (*n*=520), because for those students we could obtain data on their actual delay and dropout at the end of their four-year program. Additionally, an important reason for dropping out which we wanted to include, is when a student is obliged to stop as the result of obtaining a negative binding recommendation of continuation, a recommendation given to freshmen when the student did not pass a minimum of 75% of the study credits of the *first* academic year during this year). All freshmen students of both cohorts were invited by email. They were informed upfront about the objective and procedure of the study and participated voluntarily. The consent of the participants was obtained by virtue of survey completion. At *baseline*, demographic characteristics, psychosocial problems, self-esteem and personality profiles were assessed. The *follow-up assessment* consisted of the assessment of actual delay and dropout of all respondents and was carried out in November 2019.

Measures

The following measures were included in the *baseline measurement*:

Demographic characteristics

Age and *gender* were obtained from data of the Student Administration of the university. *Age* was expressed in years, and *gender* was coded dichotomously (1=*male*, 2=*female*). Living situation was assessed as a self-reported item and was also coded dichotomously (1=*living independently*, 2=*living with parents*).

Predictors

Anxiety and depression symptoms were assessed with the Dutch version of the Kessler-6 psychological distress scale, which is the brief 6 item version of the Kessler-10 scale, consisting of ten items (Kessler et al. 2002). The questions assessed how frequently one experienced the following six symptoms: felt nervous, hopeless, restless or fidgety, worthless, depressed and felt that everything was an effort. Responses ranged on a 5-point Likert scale from 0 (*almost none of the time*) to 4 (*almost all of the time*) and were summed to yield a K6 score between 0 and 24, with higher scores indicating higher distress and a greater tendency towards mental illness, i.e., anxiety or depression. In the present study, this scale yielded an average of 11.4 (*SD*=4.4; *2014 cohort*) and 11.5 (*SD*=4.6; *2015 cohort*) and a Cronbach's alpha of .86 in both cohorts.

Alcohol use was assessed with the Dutch version of the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C), which is the brief three item version of

the Alcohol Use Disorders Identification Test (AUDIT), consisting of ten items (Bush, Kivlahan, McDonell, Fihn, & Bradley 1998). The AUDIT-C appeared valid to identifying hazardous drinking students (Verhoog et al., 2019). The questions assessed frequency of drinking, typical number of drinks consumed on a drinking day, and frequency of binge drinking. Responses to each item were scored from 0 to 4 and were summed to yield a score between 0 and 12, with higher scores indicating hazardous drinking. In the present study, this scale yielded an average of 3.9 (*SD*=2.6; *2014 cohort*) and 3.4 (*SD*=2.6; *2015 cohort*) and a Cronbach's alpha of .82 (*2014 cohort*) and .84 (*2015 cohort*).

Self-esteem was assessed using the Dutch version of the Rosenberg Self-esteem scale RSES (Rosenberg, 1965). This scale consists of 10 items that assess a person's overall evaluation of his/her worth as a human being (Rosenberg, 1979). Responses range on a 4-point scale from 1 (*strongly disagree*) to 4 (*strongly agree*) and were summed to yield a score between 10 and 40. Higher scores *indicate higher self-esteem. In the present study, this scale yielded an average of 20.9 (SD=5.6; 2014 cohort*) and 21.3 (*SD*=5.3; *2015 cohort*) and a Cronbach's alpha of .86 (*2014 cohort*) and .87 (*2015 cohort*).

Personality profiles were assessed using the Substance Use Risk Profile Scale (SURPS; Woicik, Stewart, Pihl, & Conrod 2009), a 23-item self-report scale assessing four personality traits: Impulsivity (IMP, 5 items), Sensation Seeking (SS, 6 items), Hopelessness (HOP, 7 items) and Anxiety Sensitivity (AS, 5 items). Each item was assessed on a 4-point Likert scale ranging from 0 (*strongly disagree*) to 3 (*strongly agree*). The average scale scores of the four subscales were calculated by adding up the scores and dividing by the number of items in the scale of question. Higher scores indicate higher degrees of the personality traits in question. In the present study, the IMP scale (range 0-15) yielded an average of 2.0 (*SD*=.5) in both cohorts; the SS scale (range 0-18) yielded an average of 2.5 (*SD*=.6) in both cohorts; the HOP scale (range 0-21) yielded an average of 1.9 (*SD*=.5) in both cohorts and the AS scale (0-15) yielded an average of 2.1 in both cohorts (*SD*=.5; *2014 cohort*; *SD*=.6; *2015 cohort*). The overall scale yielded a Cronbach's alpha of .75 (*2014 cohort*) and .76 (*2015 cohort*).

The following measures were included in the *follow-up measurement*:

Academic delay and *dropout* were two dichotomously scored outcomes (0=*no*, 1=*yes*) that were examined in November 2019. With written consent of the students, we used data from the student administration of the university regarding their study progress. These data included factual indicators as the starting point and end date of the study, negative binding recommendation of continuation (i.e. the student did not pass the

minimum threshold of 45 ECTS in the first academic year and was obliged to stop) and date of graduation. Delay was defined as not having completed the required 240 credits within 4 years after starting the study program but after these 4 years, i.e., for the 2014 cohort this meant an end date after the 1st of September 2018 and for the 2015 cohort this meant an end date after the 1st of September 2019. Dropout was defined as having received a binding recommendation of continuation or having ended the study program before the expected end date of the 1st of September 2018 (2014 cohort) or the 1st of September 2019 (2015 cohort) with no graduation date.

Statistical analysis

We first ensured that there were no violations of the assumptions of linearity between predictors and the logit of the outcome, multicollinearity, and outliers. Subsequently, we used logistic regression to find the predictors that help to correctly classify participants with respect to delay and dropout in the 2014 cohort dataset. With the data from these 2014 cohort exploratory analyses a prediction model for both delay and dropout was developed. Next, based on found significant predictors in the 2014 cohort, we used cross-validation to evaluate the success of this prediction model in the 2015 cohort. Based on the confrontation of predictions and observations, we determined the value of the prediction model for practice in terms of sensitivity and specificity. All analyses were conducted using R software version 3.6.1 (R Core Team 2019). There were no missing data.

RESULTS

The sample characteristics are shown in Table 1.

Table 1. Sample characteristics

| | % Participants (or mean with SD) | |
Variable	2014 Cohort (*N*=962)	2015 Cohort (*N*=520)
Gender		
Male	41.4	36.2
Female	58.6	63.8
Age (*mean*, SD)		
Living situation	20.8 (5.2)	19.3 (2.8)
Living independently	24.4	16.2
Living with parents	75.6	83.8
Academic delay		
Delay	20.7	26.3

Table 1. Sample characteristics (Continued)

Variable	% Participants (or mean with SD)	
	2014 Cohort (*N*=962)	2015 Cohort (*N*=520)
No delay	79.3	73.7
Dropout		
Dropped out	42.1	36.2
Did not drop out	57.9	63.8
Anxiety/depression (*mean*, SD)		
Alcohol use (*mean*, SD)	11.4 (4.4)	11.5 (4.6)
Self-esteem (*mean*, SD)	3.9 (2.6)	3.4 (2.6)
Personality profiles (*mean*, SD)	20.9 (5.6)	21.3 (5.3)
Impulsivity	2.0 (0.5)	2.0 (0.5)
Sensation seeking	2.5 (0.6)	2.5 (0.6)
Hopelessness	1.9 (0.5)	1.9 (0.5)
Anxiety sensitivity	2.1 (0.5)	2.2 (0.6)

Exploratory logistic regression analyses

With the data from the 2014 cohort exploratory analyses were performed to develop a prediction model for both delay and dropout. The results of these logistic regression analyses predicting academic delay are shown in Table 2. Age and anxiety sensitivity appeared to be significant predictors of academic delay (*OR* =.94, *OR* = 1.46). Delay seems more prevalent among younger students and among students with elevated anxiety sensitivity.

Table 2. Predictors of academic delay explained by logistic regression analyses (N=962)

		B	SE	*p*	OR	95% CI
Predictors	Anxiety and depression	-0.02	0.02	.439	0.98	0.93-1.03
	Alcohol use	0.00	0.03	.966	1.00	0.94-1.07
	Self-esteem	0.00	0.02	.897	1.00	0.96-1.05
	Personality profiles					
	Impulsivity	-0.00	0.19	1.00	1.00	0.69-1.44
	Sensation Seeking	-0.06	0.15	.698	0.94	0.70-1.27
	Hopelessness	-0.06	0.27	.814	0.94	0.55-1.59
	Anxiety Sensitivity	0.38	0.18	.039*	1.46	1.02-2.09
	Demographics					
	Gender	-0.34	0.18	.054	0.71	0.50-1.01
	Age	-0.06	0.02	.014*	0.94	0.90-0.99
	Living situation	-0.25	0.22	.243	0.78	0.51-1.20

Abbreviations: B = log odds; SE = Standard Error; *p* = p-value; OR = Odds Ratio; CI = Confidence Interval
* p< .05

The results of the logistic regression analyses predicting dropout in the 2014 cohort are shown in Table 3. Gender appeared to be the strongest predictor of dropout ($OR = .67$): women have better odds of continuing their studies. Furthermore, the more symptoms of hopelessness a student experiences, the more often the student drops out of his or her study ($OR = 1.59$), while students with elevated anxiety sensitivity are dropping out less ($OR = .71$).

Table 3. Predictors of dropout explained by logistic regression analyses (N=962)

		B	SE	p	OR	95% CI
Predictors	Anxiety and depression	0.02	0.02	.290	1.02	0.98-1.06
	Alcohol use	-0.04	0.03	.173	0.96	0.91-1.02
	Self-esteem	-0.03	0.02	.122	0.97	0.94-1.01
	Personality profiles					
	Impulsivity	-0.01	0.16	.937	0.99	0.73-1.34
	Sensation Seeking	0.16	0.17	.213	1.17	0.91-1.50
	Hopelessness	0.47	0.23	.039*	1.59	1.03-2.49
	Anxiety Sensitivity	-0.34	0.15	.025*	0.71	0.53-0.96
	Demographics					
	Gender	-0.41	0.15	.006*	0.67	0.50-0.89
	Age	0.02	0.01	.101	1.02	1.00-1.06
	Living situation	0.15	0.18	.421	1.16	0.81-1.67

Abbreviations: B = log odds; SE = Standard Error; p = p-value; OR = Odds Ratio; CI = Confidence Interval
* p< .05

Probability estimates for delay and dropout
Based on significant predictors of the 2014 cohort logistic regression, the probability of delay and dropout for the 2015 cohort were estimated. Delay probabilities ranged from .07 to .32. Thus, all estimated probabilities for the 2015 students in terms of *academic delay* were lower than .5 (see Figure 1), indicating that although there was variance in the probability of academic delay between students based on their age and anxiety sensitivity scores, for none of the students in the 2015 cohort were very likely to actually experience delay.

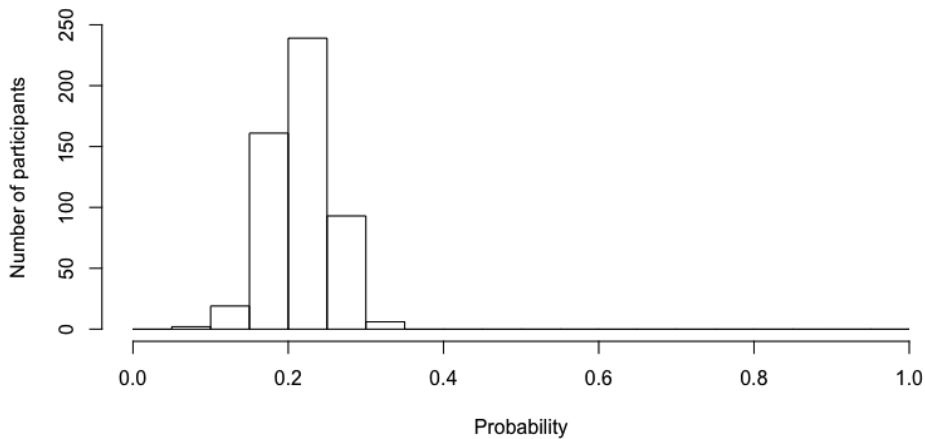Figure 1. Probability estimates of academic delay (2015 cohort)

Figure 2 shows the distribution of the estimated dropout probability for students in the 2015 cohort. The dropout probabilities range from .19 to .80 with a mean of .46. For 84.8% of the 2015 students, estimated probabilities in terms of *dropout* were lower than .5 (see Figure 2), indicating that although there was variance in the probability of dropout between these students based on their gender, hopelessness and anxiety sensitivity scores, we expected that most students remained in the study. However, there is a group of 15.2% of the cohort for which drop-out is expected based on their gender, hopelessness and anxiety scores.

Figure 2. Probability estimates of dropout (2015 cohort)
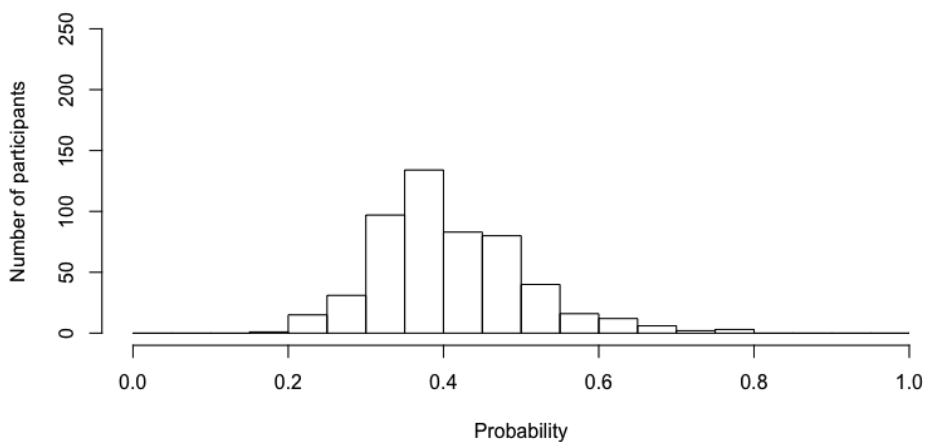
Comparison of predicted and observed dropout

In the previous paragraph, we presented the probabilities of delay and dropout for the 2015 cohort based on the significant predictors that have been identified as a result of the 2014 cohort logistic regression analyses. The next step was to make predictions based on these probabilities with a threshold of .5; > .5 is an indication of predicted academic delay and < .5 is an indication of predicted no delay. We confronted this classification based on model predictions with the actual observed data for the use of determining the value of the prediction model for practice in terms of sensitivity and specificity, as shown in Table 4 and 5.

Table 4. Comparison of predicted and actual academic delay

	Predicted group membership		
	Non-delay	**Delay**	**Total**
Actual non-delay	383	0	383
Actual delay	137	0	137
	520	0	520

Note. Percentage correctly predicted = 73.7%; sensitivity = .00; specificity = 1.00; positive predictive value = .00; negative predictive value = .74

Table 4 shows that 73.7% of the students did not experience any delay in practice. The model predicted *no delay* correctly for all of these students, (i.e., a specificity of 73.7%/73.7%=1.00). However, sensitivity, i.e., correctly predicting *actual* delay, is .00. Based on the low delay probabilities, all students were most likely to experience no delay. Hence, the model predicted 100.0% of the non-delayed students correctly, but 0.0% of the actual delayed students (26.3%) based on student anxiety and age.

Table 5. Comparison of predicted and actual dropout

	Predicted group membership		
	Non-dropout	**Dropout**	**Total**
Actual non-dropout	294	38	332
Actual dropout	147	41	188
	441	79	520

Note. Percentage correctly predicted = 64.4%; sensitivity = .12; specificity = .66; positive predictive value = .22; negative predictive value = .88

Table 5 shows that in total 64.4% of the 2015 cohort experienced *no dropout* in practice. The specificity (i.e., correctly predicted *no dropout*) was 0.66. The sensitivity (i.e., correctly predicted *dropout*) was .12, based on anxiety sensitivity, hopelessness

and gender. In general, the results of the confirmatory analyses for delay and dropout indicate that the significant first-year predictors from the 2014 cohort mainly predict cases of students that do not experience delay or dropout, and only a small proportion of students that do experience delay and drop-out by the end of their studies.

DISCUSSION

Key results

The purpose of the present study was to find predictors of academic delay and dropout among students in higher education from anxiety and depression symptoms, alcohol (mis)use, self-esteem and personality profiles of freshmen, and to develop and validate a prediction model for academic delay and dropout. Data from the 2014 cohort were used to develop a prediction model that was evaluated for success through cross-validation with the data of the 2015 cohort. We found evidence for a predictive value of age and anxiety sensitivity for delay, and gender, hopelessness and anxiety sensitivity for drop-out. However, it seems that our prediction model does not generalize well enough from the data of our first cohort to our second cohort (i.e., overfitting): the prediction model predicted only 26.3% dropouts of the 2015 cohort correctly, and the expectancy for delay was <.05 based on the 2015 cohort. Study delay may, perhaps more than dropout, be affected by factors that were not included in the current prediction model and/or delay cannot (easily) be predicted solely from freshmen data.

Psychosocial problems

An interesting finding in the present study was that no significant relationship was found between psychosocial problems, i.e., anxiety, depression and alcohol (mis)use, and delay and dropout, while a brief inventory of personality risk profiles (SURPS) *did* contribute to the prediction of delay and dropout. The lack of significant relationship between psychosocial problems and delay and dropout is contrary to the findings of several earlier studies that show that higher education students are a particularly vulnerable group for the development of psychosocial problems, and that it is likely that psychosocial problems are predictors of academic success (Auerbach et al. 2016; Newcomb-Anjo et al. 2017; Tosevski et al. 2010; Zalihić et al. 2017). However, a large longitudinal study that specifically assessed the prevalence of mental *disorders* (instead of symptoms) in the Netherlands, the Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2), shows that the psychopathology of students in higher education (e.g., anxiety, depression and problematic alcohol use) does not seem to differ from other young adults between 18 and 24 years old (De Graaf et al. 2012).

The finding that the present study showed that personality profiles contributed to the prediction of delay and dropout might be explained by the fact that these profiles are present before associated psychosocial problems evolve, and that these profiles predict further development of psychosocial problems. Furthermore, it is plausible that psychosocial problems evolve during the course of the study program, as students with a vulnerable personality profile continue to experience stress and have difficulties with the increased autonomy that is expected of them. Therefore, the predictive power of psychosocial problems may increase in later study years and may explain why psychosocial problems had limited power to predict delay and dropout in the present study, which was conducted among a freshmen sample. Several studies support this hypothesis (De Graaf et al. 2012; Gezondheidsraad, 2018; Hope & Henderson 2014b; Peeters et al. 2019; Živčić-Bećirević, Jakovčić, & Juretić 2011). They suggest that for both psychosocial problems and hazardous alcohol use mixed results have been found were find in studies regarding students. Anxiety and depression seem to fluctuate during the years of study.

The literature shows many inconsistencies for the relationship between alcohol use and academic performance. Although hazardous drinking among students is often downplayed due to the societal acceptance of heavily drinking as part of the student drinking culture (Verhoog et al. 2019), evidence shows that alcohol misuse seems to be a risk factor for delay and dropout (Jackson et al. 2001). However, for many students the use of alcohol tends to decrease over the course of their studies, which suggests that negative consequences for academic performance may not be long-lasting (Ham & Hope 2003). The decrease of alcohol use among students is consistent with identified trajectories of heavy alcohol consumption that tended to decrease beginning around the age of 21 (Jackson, Sher, & Wood 2000) and studies that show that many adults show natural recovery of alcohol problems without the aid of professional intervention (Jackson et al. 2006; Sobell, Cunningham, & Sobell 1996). The Dutch National Health Council concluded in their review that it is as-yet unclear whether alcohol use leads to poorer educational attainment or the other way around, and whether such effects are temporal or long-lasting (Gezondheidsraad 2018). Furthermore, they stated that it could not be excluded that found relationships were caused by third variables, such as personality traits that have been related to both higher alcohol consumption and poorer academic performance (e.g., impulsivity).

Perhaps the inconsistencies are a result of alcohol use being a much more social activity compared to other risk behaviors (Engels & Knibbe 2000). A study by Peeters et al. (2019) showed less impactful outcomes for alcohol use than for the other

trajectories of risk behaviors that were examined (e.g., smoking and cannabis use). It seems that alcohol use is more norm-driven (Jackson et al. 2000) and therefore, alcohol use may not only be a risk factor, but also be a buffer: drinking with friends might also contribute to social cohesion in students. Because of the inconsistencies between studies, further research on the relationship between students' alcohol use and their academic performance is needed.

Personality profiles

Our findings showed that personality dimensions anxiety sensitivity and hopelessness of the brief inventory of personality risk profiles (SURPS) were significant predictors of delay and dropout. These findings are supported by previous research showing that personality traits that are related to these personality dimensions (e.g., neuroticism, anxiety and self-consciousness) are strongly associated with college student adjustment (Larose, Duchesne, Litalien, Denault, & Boivin 2019; Pritchard & Turri 2007) and are important predictors of academic achievement (Kappe & Van Der Flier 2012b). However, there's little research regarding anxiety sensitivity and hopelessness specifically as predictors of academic delay or dropout for comparison. Among the few studies, some found a negative correlation between anxiety and academic success, which is consistent with our findings regarding the association between anxiety sensitivity and dropout (Newcomb-Anjo et al. 2017; Tosevski et al. 2010). Contrary to these studies, a study by Zalihić et al. (2017) found that anxiety sensitivity has a positive impact on academic success of students, which is consistent with our findings of the positive association between anxiety sensitivity and academic delay. We found a positive relationship between hopelessness and dropout, indicating that when a student lacks positive expectations of their studies, this inhibits adequate studying behavior, which forms a barrier for the continuation of one's studies.

Strengths, limitations and implications for future research

The findings of the present study should be interpreted in light of some limitations. In the present study, dropout was defined as having received a binding recommendation of continuation or having ended the study program before the expected end date, with no graduation date. Although often dropout is not voluntarily, it can be a voluntary choice. For instance, as a student prefers to start working instead of continuing their studies, or as a student wants to switch to another study program. Since we did not take explicit voluntary choices into account, our dropouts may also include young adults who continued studying or started working. Nevertheless, for intervention purposes, this group of young adults is similarly relevant, as for educational institutions any form of dropout is costly and should be prevented. In addition, mental health

issues could similarly underlie the voluntary choice to change of a study (e.g. indecisive or not fitting in) or start working.

Our findings highlight that freshmen data may be insufficient to predict dropout and, especially, delay. It is advisable to not only consider a freshmen sample, but a sample which also includes students in higher years of study. If a freshmen sample is used, it is advisable to enrich the data to make this data more useful by adding variables or repeated observations of the same variables. This makes it possible to, for instance, determine differences in scores between several observations. Additionally, although we chose to select factors to predict delay and dropout that were grounded in prior research, it seems that delay is more difficult to predict than dropout, and that study delay, more than dropout, may be affected by variables which were not included in the model. It is possible that protective factors, such as resilience, may help to prevent delay even in the presence of risk factors but may be unable to protect against the more severe outcome of dropout. As delay may be an interplay between psychosocial problems and protective factors, future longitudinal studies may broaden the prediction model with other possible predictors of specifically academic delay, such as other psychological symptoms and possible protective determinants such as self-efficacy, resilience and engagement, for which evidence is growing (Ahmed & Julius 2015; Pitzer & Skinner 2017; Sarra, Fontanella, & Di Zio 2018; Upadyaya & Salmela-Aro 2013). Furthermore, in order to be able to identify as much dropout-prone students as possible, it is interesting to investigate the predictive value of delay for dropout. Further insights in mainly academic delay are needed, as delay seems to have different, specific characteristics at play than dropout, of which we already know more.

We did not take repeated measures or later measures of psychological issues into account, as the students who dropped out had missing data on later assessments and these missings were therefore 'missing not at random' (MNAR), which cannot be resolved with statistical techniques. It is likely though, that later measures are better predictors of study delay and drop-out. Further insight into the development of students' personality profiles and psychosocial problems over the course of their studies seems necessary.

Although the study has some limitations, there are also strengths. The lack of longitudinal data, which hinders the possibility to draw conclusions based on causality, was the main point of criticism in the report of the Dutch Health Council (Gezondheidsraad 2018) on alcohol use among adolescents and young adults, which therefore was inconclusive on the relationship between alcohol use and academic

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performance. The longitudinal design of the present study contributes to filling this gap and provides reliability in the results and conclusions.

Furthermore, by using cross-validation, we tried to reduce the odds of overfitting, as we verified if our model that fits one dataset is also useful for future predictions. Prediction modeling is a relevant strategy in this context where the clinical relevance of the study lies in early and correct classification of those students that may experience later delay and drop-out.

Finally, our data on the outcome variables academic delay and dropout were retrieved from the school's administration and were therefore based on facts instead of self-reports. This is important, as it is likely that self-reported delay correlates with personality traits like neuroticism.

Implications for practice

Our findings have important implications for assessment of psychosocial problems, prevention and intervention within universities. Many studies on the assessment of psychopathology among students concern the assessment of mental health disorders which limits the scope while there are many students that experience symptoms from which they suffer, but do not have a mental disorder. It is important that we get a good understanding of this group of students as well in order to offer them the right assistance. A recent and promising approach to this matter is that of the network approach to psychopathology in which symptoms are caused by other symptoms, rather than by a latent (brain) disease (Borsboom, Cramer, & Kalis 2019; Borsboom 2017). This approach could be relevant for the assessment and treatment of psychopathology among students since it is suitable for students where addressing symptoms (e.g., test anxiety or stress) with low-threshold interventions, may be more acceptable than treatment for mental disorders (Cuijpers et al. submitted). It is recommended to incorporate this approach in student wellbeing research and interventions.

They suggest that delay or dropout may be prevented by increasing attention for students' personality risk profiles. It is recommended that universities invest in early recognition and use school wide or class wide screenings among students in all study years to help identify vulnerable at-risk students based on personality risk profiles. Having an assessment instrument to identify at-risk students enables university staff to appropriately refer students to further assessments and targeted personality-matched early interventions in personal student counseling. These brief personality-targeted interventions may promote health in students by preventing a variety of psychiatric

symptoms (Conrod et al. 2008) and subsequently dropout. Targeting precursors to anxiety, depression and/or alcohol misuse, rather than the problematic internalizing or externalizing behavior itself has greater potential for prevention as it is focused on the roots of possible problems (Conrod et al. 2008). As this intervention was developed in adolescents, it should first be tested in college students.

CONCLUSION

Our results demonstrate that dropout, and specifically academic delay, are difficult to predict based on psychosocial problems and personality profiles in a freshman sample. Although personality profiles contributed to the prediction of dropout cases, our findings suggest that risky signs visible in the first year of study may not contribute to dropout in that much detail. Whereas freshman often are seen as main risk group with regard to academic delay and dropout, it is suggested that risk signs could be seen throughout the years of study and that other factors are at play regarding the prediction of delay and dropout. Specifically academic delay seems to be an interplay between symptoms of psychosocial problems and protective factors. Future research may broaden the prediction model with other possible indicators of both delay and dropout, such as other personal characteristics, additional psychosocial problems, but mainly with more protective factors like self-efficacy, resilience and engagement, for which evidence is growing. Future studies could also focus on the predictive value of the development of students' personality profiles, protective traits, psychosocial problems over the course of one's studies. The recent network approach to psychopathology seems highly relevant for future student wellbeing research and interventions, as it aims at students with symptoms of mental disorders. Based on our findings and this network approach, cautious recommendations are made to universities to use screeners aimed at identifying symptoms of psychosocial problems related to mental disorders, and to test brief symptom-oriented or risk-factor oriented (e.g., personality-based) interventions. These interventions may promote students' mental health by preventing internalizing and externalizing problems and subsequently prevent delay and dropout.

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Predicting the risk of academic delay and dropout for students in higher education

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CHAPTER 5

Predicting disclosure and help-seeking in university students with psychosocial problems based on stigma and attitudes towards disclosure and help-seeking

ABSTRACT

Despite high prevalence of mental health problems among university students, there's a gap between the need for help and the actual treatment received. This study investigated disclosure on distress and hazardous alcohol use and help-seeking behavior in a sample of 1,791 students of a Dutch university of applied sciences. Students' perceived public and personal stigma, and attitudes towards disclosure and help-seeking were assessed as possible predictors of disclosure and help-seeking behavior. Results of the analysis of variance and logistic regression analysis indicated that perceived public and personal stigma did not predict disclosure and help-seeking behavior, but that attitudes towards disclosure and help-seeking did. Students with both distress and hazardous alcohol use have the least tendency to disclose their problems to family, friends or classmates, but at the same time they do tend to seek help. Disclosure and seeking help for mental health challenges are health promoting competencies that seem to need more attention in university students. Although further research needs to validate these findings, it is recommended to promote disclosure and help-seeking among students by investing in mental health literacy programs, to educate students about mental health issues, raise awareness on available mental health services and their potential benefits.

INTRODUCTION

University students are a vulnerable population with high risks for development of mental health problems and disorders (Tosevski, Milovancevic, & Gajic, 2010). They are in the midst of young adulthood, which is known to be a critical period in which 75% of mental health problems have their first onset before the age of 24 (Kessler et al., 2005). Although university may be an exciting period for some students, for others it is a difficult time. For a number of them, pre-existing psychosocial problems may persist or worsen during the course of their studies, while others develop psychosocial problems for the first time (McLafferty et al., 2017; Stoliker & Lafreniere, 2012; Tosevski et al., 2010). Severe distress, burnout, loneliness, problematic alcohol use, illicit substance use, anxiety, depression and even suicidal ideation are some of the mental health issues that have been documented as highly prevalent in university students over the past years (Auerbach et al., 2016; Corrigan et al., 2016; Dyrbye et al., 2008; Hunt & Eisenberg, 2010; Ishak et al., 2013; Newcomb-Anjo, Villemaire-Krajden, Takefman, & Barker, 2017; Reyes et al., 2016; Stoliker & Lafreniere, 2012; Tosevski et al., 2010; Verhoog et al., 2019). There is evidence that these mental health issues can have a serious impact on academic performance and may subsequently lead to academic delay and dropout (McLafferty et al., 2017; Zivin, Eisenberg, Gollust, & Golberstein, 2009).

The high prevalence of distress and mental health disorders among students would be less concerning if these students were receiving appropriate treatment (Hunt & Eisenberg, 2010). However, research shows that there is a gap between the need for mental health treatment and actual receipt of treatment, despite the fact that most students have access to mental health services on campus and insurance to cover these services (Sontag-Padilla et al., 2018). Without appropriate treatment for mental health problems, students face a range of potentially serious and lasting consequences, including dropping out, difficulties with relationships and future mental illness (Kessler et al., 2005; Sontag-Padilla et al., 2018; Sontag-Padilla et al., 2016). Students with mental health problems appear to experience barriers for the use of mental health services which affect their help-seeking behavior (Eisenberg, Hunt, & Speer, 2013). Although students' problems may pass, when they don't, many students suffer in silence, don't seek help and go unnoticed, or seek help in a later stage when their problems already have become more severe. This makes it difficult to offer assistance, while by increasing helping-seeking behaviors, student mental health and subsequently their academic performance, could be considerably improved. This makes it important to better understand what the barriers are that students experience regarding help-seeking for mental problems.

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Help-seeking behavior is shaped by intention, which, in turn, is influenced by attitudes (Li, Denson, & Dorstyn, 2018). There are several frameworks with explaining theories on help-seeking behavior for mental health. One of them is the Health Belief Model, which emphasizes the individual approach to explain perceived need and help-seeking (Rosenstock, 1966). The model is based on the theory that one's willingness to change health behaviors and seek help, is primarily due to 1) perceived susceptibility: the belief that one's behavior concerns a risk; 2) perceived severity: the extent to which one considers the consequences of their behavior to be serious enough to avoid these consequences; 3) perceived benefits: the belief that changing behaviors will improve one's problem; and 4) perceived barriers, like social difficulties or stigma (Rosenstock, 1966). Consistent with the Health Belief Model, many studies have focused on individuals' attitudes and beliefs about mental illness and treatment to understand the individual students' decision to (not) seek help for his or her mental health problems. These studies conclude that negative attitudes and beliefs are significant barriers to help-seeking, in which two forms of stigma are distinguished: perceived public stigma (negative attitudes toward oneself) and personal stigma (own negative attitudes to help-seeking) (Eisenberg et al., 2012). Perceived public stigma refers to an individual's perception of public stigma: negative stereotypes and prejudice about mental illness (such as: 'people with mental illness are weak') (Corrigan, 2004). Students' own view of people who use mental health treatment, which may differ from how students would view themselves in the same situation (i.e., self-stigma), is referred to as personal stigma (Eisenberg et al., 2012).

Help-seeking facilitating factors which encourage someone to seek help for their distressing problems include being willing to self-disclose personally distressing information to others (Romanson, 2018). Students' intentions to seek help are likely related to the fear of disclosing personal information to others and not fitting in anymore. Having a sense of commitment and fitting in with their peer group is very important to young adults in their developmental stage (Crone & Dahl, 2012; Erikson, 1968). Therefore, students with mental health problems are confronted with the dilemma of disclosure. On the one hand, disclosure might lead to stigmatization with a negative impact for conformity, but on the other hand disclosure may lead to social support provision (Bos, Kanner, Muris, Janssen, & Mayer, 2009). Corrigan et al. (2016) state that the desire for disclosure is directly associated with identity, i.e., whether students view themselves as people with mental health issues. Corrigan et al. (2016) also state that experiencing barriers to disclose mental health problems are a result of shame of one's issues. Additionally, Corrigan et al. (2016) suggest disclosure may be a key factor in decreasing stigma: the less people endorse stereotypes about mental

health issues, the more likely one will disclose. Women endorse stigma less than men and it is expected that women are more likely to disclose than men (Corrigan et al., 2016).

The aforementioned studies show that students seem to come across barriers in disclosing mental health issues and seeking help. Stigma and attitudes towards disclosure and help-seeking behavior are seen as a key-factors that contribute to decisions concerning disclosure and help-seeking or not. It is likely that perceived public and personal stigma also form barriers for disclosure and help seeking in students. Therefore, it is important to determine if students indeed experience stigma as a barrier for disclosure and help seeking, what their attitude towards disclosure and help seeking is, and to what extent they actually disclose and seek help. The main aim of the present study was to determine if stigma and attitudes towards disclosure and help-seeking behavior predicted actual disclosure and help seeking among students.

METHODS

Procedure and participants

Cross-sectional data were used from the 6th wave of the Study Environment, Health and Study Success online survey, carried out between December 2018 and February 2019 in a large university of applied sciences in the Netherlands. All fulltime students were invited by email (n=1,791). They were informed upfront about the objective and procedure of the study and participated voluntarily and anonymously. The consent of the participants was obtained by virtue of survey completion.

Measures

Outcomes

Our dependent variables of main interest were binary. We assessed actual informal disclosure (within one's own social contacts and networks) with a single item: 'Did you disclose your mental health problems to family, friends and/or classmates?' (0 = *no*; 1 = *yes*). We also included a single item on actual help seeking from professional sources: 'Did you seek help with a mental health professional or a student counselor within or outside the university?' (0 = *no*; 1 = *yes*). Note that disclosure and help-seeking outcomes were only assessed among students who indicated that they suffered from psychosocial problems on a separate question in the survey, apart from the screeners for distress and alcohol use (n=708), because the precondition for disclosure of mental health problems and help-seeking behavior is that one is aware of and suffers from such problems.

Psychosocial problems
Distress (symptoms of anxiety and depression) was assessed with the Dutch version of the Kessler-6 psychological distress scale, which is the brief 6 item version of the Kessler-10 scale, consisting of ten items (Kessler et al., 2002). The questions assessed how frequently one experienced the following six symptoms: felt nervous, hopeless, restless or fidgety, worthless, depressed and felt that everything was an effort. Responses ranged on a 5-point Likert scale from 1 (*almost never*) to 5 (*almost always*) and were summed to yield a K6 score between 1 and 30, with higher scores indicating higher distress and a greater tendency towards mental illness, i.e., anxiety or depression. *Alcohol use* was assessed with the Dutch version of the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998), which is the brief three item version of the Alcohol Use Disorders Identification Test (AUDIT). The questions assessed frequency of drinking, typical number of drinks consumed on a drinking day, and frequency of binge drinking. Responses to each item were scored from 0 to 4 and were summed to yield a score between 0 and 12, with higher scores indicating hazardous drinking. The AUDIT-C appeared valid to identifying hazardous drinking students, e.g. at-risk students in our previous study (Verhoog et al., 2019). Being at risk for hazardous alcohol use in the present study was determined based on this previous study, in which we suggested specific cut-offs of 7 for female students and 8 for male students.

Demographics
Age and *gender* were obtained from data of the Student Administration of the university. Age was expressed in years, and gender was coded dichotomously (1=*male*, 2=*female*).

Predictors
Our predictors were divided into two categories: *attitudes* (attitudes towards disclosure and attitudes towards help-seeking behavior) and *stigma* (Perceived public stigma and Personal stigma). *Attitudes towards disclosure* was assessed with the Mental Illness Disclosure Scale (Bos et al., 2009). This is a 12 item scale measuring the intention to disclose mental health problems on a 7 point Likert Scale (0 = *totally disagree* to 6 = *totally agree*). Higher average scale scores indicated greater intentions to disclose mental health problems.

Attitude towards help-seeking behavior was assessed with the Inventory of Attitudes Toward Seeking Mental Health Services (IASMHS), a 24 item scale consisting of 3 subscales: psychological openness (the degree to which one is open to acknowledging

the presence of a psychological problem and to seek professional care for such a problem), help-seeking propensity (one's intention and perceived ability to seek help for psychological problems) and indifference to stigma (how concerned one would feel were significant others to discover that they were receiving psychological care) (Mackenzie, Knox, Gekoski, & Macaulay, 2004). Each scale included 8 questions and answers were measured on a 5 point Likert Scale (0 = *totally disagree* to 4 = *totally agree*), giving a range of each subscale from 0-32. The total IASMHS gives a range from 0-96, with higher scores indicating greater intention to seek help.

Perceived public stigma was assessed using an adaptation of the Discrimination-Devaluation (D-D) Scale developed by Link (1982), after the example of Eisenberg, Downs, Golberstein, & Zivin (2009). In the D-D scale the extent to which one agrees on 12 items on public stigma that begin with "Most people believe…" or "Most people think…" or "Most people would.." was measured on a 5 point Likert scale: *totally agree* (=0) to *totally disagree* (=4) (Link, 1987; Link, Cullen, Struening, Shrout, & Dohrenwend, 1989). The original D-D scale refers to 'mental patient' or a 'former mental patient' or 'a person who has been hospitalized for mental illness'. Because we wanted to assess perceived public stigma regarding a broader concept of mental health treatment than only institutional treatment for severe mental illness, we adapted the wording to 'a person who has received mental health treatment', after the example of Eisenberg and colleagues. Average scale scores were computed, with higher scores indicating higher perceived public stigma.

Personal stigma, students' own stigmatizing attitudes about mental health treatment, was also assessed after the example of Eisenberg, Downs, Golberstein & Zivin (2009). Three items of the D-D scale were adapted replacing 'most people' by 'I'. These three items referred to a negative attitude (…'would think less of someone…'), an accepting behavior (…'would accept as a close friend…'), and an accepting attitude (…'think someone is just as trustworthy…'). These three items were measured on a 5 point Likert scale ranging from *totally agree* (=0) to *totally disagree* (=4). The average scale score was computed, with higher scores indicating higher personal stigma.

Statistical analysis

Sociodemographic characteristics and descriptive values for all variables were calculated using IBM SPSS Statistics, version 25 (IBM Corp., 2017). Normality tests were performed and revealed a normal distribution of the data. Intercorrelations were calculated for all predictors to detect multicollinearity, which occurs when variables are over correlated. This could cause problems in validation, interpretation,

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and analysis of the model. In the present study, all correlations were below .40, indicating that our predictors were not strongly correlated, and collinearity should not be an issue (Lin, 2008; Pheko, Chilisa, Balogun, & Kgathi, 2013). Furthermore, we tested for unadjusted differences in mean levels for attitudes towards disclosure and help-seeking behavior, and public and personal stigma across subgroups using t-tests. Additionally, multivariate analysis of variance (MANOVA) was used to test the significance of differences between the levels of these attitudes and stigma of four subgroups with or without one or more symptoms of distress and alcohol use. In case of significant effect(s), the MANOVA was followed up by discriminant analysis to determine the relative contribution of the different variables to the multivariate effect (which is the correct follow-up, instead of the often used ANOVA follow-up, see Huberty & Morris, 1989). Finally, since our outcomes are binary, a logistic regression was conducted with the dependent variables disclosure and help-seeking behavior. The predictors used in each of these logistic regressions were attitude towards disclosure, attitude towards help-seeking behavior, and perceived public stigma and personal stigma. As disclosure and help-seeking are related to experienced mental health problems, we controlled for the most common mental health problems, i.e., distress and hazardous alcohol use, as well as for age and gender.

RESULTS

Sample characteristics are shown in Table 1. The sample had a mean age of 21.5 years old (SD = 3.8) and almost 60% was female. More than half of the students in our sample experienced psychological distress (56.3%), i.e., symptoms of anxiety and depression, and 20.9% of our sample were at risk for hazardous alcohol use. Problems were disclosed by 32.8% of the students. Half of the students with distress and/or hazardous alcohol use sought help for their problems (49%) and the other half did not (51%).

Before conducting analyses of variance and logistic regression analyses, descriptive statistics and intercorrelations were calculated for all predictors. Table 2 summarizes means, standard deviations and intercorrelations of measures of perceived public and personal stigma, and attitudes towards disclosure and help seeking. Furthermore, Table 2 shows medium to low levels of both perceived public stigma (M=1.8, SD=0.3) and personal stigma (M=1.6, SD=0.4). This indicates that although students hold slightly more perceptions of collectively held prejudices regarding people with mental health issues than that they hold prejudices themselves. Overall they experience little stigma. Additionally, a low to moderate mean score was also found on both

the attitude towards disclosure scale (*M*=2.8, *SD*=1.1) and the attitude towards help seeking behavior scale (*M*=1.8, *SD*=0.3). This suggests reluctance among students to disclose mental health problems to their family, friends or classmates, and not a favorable attitude to seek help among professionals within or outside of university.

Table 1. Sample characteristics

	% Participants
Variable	(***N*=1791**)
Gender	
Male	41.3
Female	58.7
Age (*mean*, SD)	21.5 (3.8)
Living situation	
Living independently	27.0
Living with parents	73.0
Year of study	
1st	29.8
2nd	20.3
3rd	22.3
4th	18.0
5th or higher	9.6
Psychological distress (K6)	
No	43.7
Yes	56.3
Hazardous alcohol use (AUDIT-C)	
Not at risk	78.1
At risk	20.9
Distress and hazardous alcohol use combined	
No distress, no alcohol risk	33.3
Distress, no alcohol risk	44.8
No distress, alcohol risk	10.4
Distress and alcohol risk	11.5

Table 2. Means (M), Standard Deviations (SD), and Intercorrelations of Perceived Public Stigma, Personal Stigma, Attitude towards Disclosure and Help-Seeking Behavior (N=1,791)

	M	*SD*	1	2	3	4
1. Perceived Public Stigma	1.8	.3	-	0.0	.04	.02
2. Personal Stigma	1.6	.4		-	-.04	.07
3. Attitude Disclosure	2.8	1.1			-	-.40
4. Attitude Help-Seeking Behavior	1.8	.3				-

As shown in Table 3, there were significant differences regarding *attitude towards disclosure* in scores for students with distress (*M*=2.66, *SD*=1.13) and students without distress (*M*=3.03, *SD*=1.02); t(1789)=7.131, p < 0.001, which suggests that students with distress tend to disclose less than students without distress. Regarding *attitude towards help-seeking behavior* significant differences were found in the scores for men (*M*=1.86, *SD*=0.31) and women (*M*=1.80, *SD*=0.28); *t*(1789)=4.322, *p* < 0.001, *and* in scores for students with distress (*M*=1.86, *SD*=0.31) and without distress (*M*=1.79, *SD*=0.28); *t*(1789)= -4.821, *p* < 0.001 *and finally*, in scores for students with an alcohol risk (*M*=1.86, *SD*=0.33) and without an alcohol risk (*M*=1.82, *SD*=0.29); *t*(1789)= -2.455, *p* < 0.05. These findings indicate that male students, students with distress and students at risk for hazardous alcohol use have a more positive attitude toward help-seeking. Furthermore, the *perceived public stigma* of students with an alcohol risk (*M*=1.78, *SD*=0.37) and without an alcohol risk (*M*=1.83, *SD*=0.33) were found to be significantly different; *t*(1789)=2.987, *p* < 0.05, indicating that students at risk for hazardous alcohol use experience more public stigma regarding mental health problems than students who are not at risk for hazardous alcohol use. Finally, there were significant differences regarding *personal stigma* in men (*M*=1.66, *SD*=0.44) and women (*M*=1.62, *SD*=0.41); *t*(1789)=2.047, *p* < 0.05. This result suggests that male students experience greater personal stigma than women.

Table 3. Results of the Independent Samples t-Test (N=1,791)

	Gender (Mean, *SD*)		Distress (Mean, *SD*)		Alcohol risk (Mean, *SD*)	
Variable (scale range)	Male (n=740)	Female (n=1051)	No distress (n=783)	Distress (n=1008)	No alcohol risk (n=1398)	Alcohol risk (n=393)
Attitude disclosure (0-4)	2.85 (1.07)	2.80 (1.12)	3.03 (1.02)*	2.66 (1.13)*	2.83 (1.08)	2.77 (1.16)
Attitude help-seeking (0-6)	1.86 (0.31)*	1.80 (0.28)*	1.79 (0.28)*	1.86 (0.31)*	1.82 (0.29)*	1.86 (0.33)*
Perceived public stigma (0-4)	1.83 (0.35)	1.81 (0.33)	1.82 (0.33)	1.81 (0.35)	1.83 (0.33)*	1.78 (0.37)*
Personal stigma (0-4)	1.66 (0.44)*	1.62 (0.41)*	1.65 (0.42)	1.63 (0.43)	1.64 (0.42)	1.63 (0.44)

*p=<0.05

Additionally, a multivariate analysis of variance (MANOVA) was performed to investigate effects of symptoms of distress and hazardous alcohol use on attitudes towards disclosure and help-seeking behavior, and perceived public and personal stigma. A significant main effect was found for distress (Wilks' Λ = .968, $F_{4,1786}$ = 14.615, p < 0.01, η^2 = 0.03), and for hazardous alcohol use (Wilks' Λ = .991, $F_{4, 1786}$ = 4.120, p < 0.01, η^2 = 0.08). In addition, significant interactions between distress and hazardous alcohol use were found (Wilks' Λ = .953, $F_{4,1786}$ = 7.204, p < 0.01, η^2 = 0.02). With the interaction effect being significant, the means and standard deviations of the subgroups are presented in table 4.

Table 4. Results of the MANOVA analysis with Bonferroni Post-hoc Test (N=1,791)

	Subgroup				
	No distress, no alcohol risk (N=596)	Distress, no alcohol risk (N=802)	No distress, alcohol risk (N=187)	Distress and alcohol risk (N=206)	Total (N=1,791)
Predictor (scale range)	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)
Attitude disclosure (0-4)	3.00 (0.28)	2.71 (1.11)	3.13 (1.04)	2.44 (1.18)	2.82 (1.10)
Attitude help-seeking (0-6)	1.78 (0.28)	1.84 (0.29)	1.81(0.29)	1.90 (0.36)	1.83 (0.30)
Perceived public stigma (0-4)	1.84 (0.32)	1.82 (0.34)	1.78 (0.36)	1.77 (0.39)	1.82 (0.34)
Personal stigma (0-4)	1.66 (0.42)	1.63 (0.42)	1.63 (0.40)	1.62 (0.47)	1.64 (0.43)

In order to determine the relative contribution of the variables to the multivariate effects described above, we performed a series of discriminant analyses (Huberty & Morris, 1989). For the first multivariate effect (distress) the most strongly contributing variables were attitude towards disclosure and attitude towards help-seeking behavior. The relative contributions to the multivariate difference between low and high distress were (in descending order, with structure coefficients in parentheses): attitude towards disclosure (.93), attitude towards help-seeking behavior (-.63), perceived public stigma (.15) and personal stigma (.11). These results indicate that students with high distress have the least tendency to disclose their problems to family, friends or classmates, but at the same time they show the most positive attitude towards seeking help with mental health care professionals.

For the second multivariate effect (hazardous alcohol use) the most strongly contributing variables were perceived public stigma, attitude towards help-seeking behavior and attitude towards disclosure. The relative contributions to the multivariate difference between non-hazardous and hazardous alcohol use were: perceived public stigma (.77), attitude towards help-seeking behavior (-.63), attitude towards disclosure (.28) and personal stigma (.15). These results indicate that students with hazardous alcohol use tend to disclose, but have little tendency to seek help.

In the discriminant function of the interaction (including the four groups in Table 4), the first function explained 82.5% of the variance, followed by a second function that explained 16.1% of the variance. The most strongly contributing variables in the first function were attitude towards disclosure (.93) and attitude towards help-seeking behavior (-.63). In the second function perceived public stigma was the most important contributing factor (-.73). These interaction results indicate that students with high distress and hazardous alcohol use have the least tendency to disclose their problems to family, friends or classmates, but at the same time they show the most positive attitude towards seeking help with mental health care professionals and the least perceived public stigma.

Predictive analyses using logistic regression
The last step involved using stepwise logistic regression analysis to determine predictors of actual disclosure and help-seeking behavior. Details results of the stepwise binary logistic regression analyses are shown in Table 5.

Table 5. Logistic regression analyses for disclosure and help-seeking behavior (N=708)

		Disclosure			
Variable	B	Standard Error	Odds Ratio	95% CI	*p*-value
Constant	.780	1.448	2.182	-	.590
Demographics					
Age	.069	.038	1.071	[.995-1.153]	.067
Gender	.364	.222	1.438	[.930-2.225]	.102
Psychosocial problems					
Distress	-.244	.370	.783	[.379-1.618]	.510
Alcohol risk	-.255	.247	.775	[.478-1.257]	.301
Attitude					
Attitude disclosure	.569	.109	1.766	[1.426-2.186]	<.001*
Attitude help-seeking	-.876	.382	.417	[.197-.881]	.022*

Table 5. Logistic regression analyses for disclosure and help-seeking behavior (N=708) (Continued)

Help-seeking behavior					
Variable	**B**	**Standard Error**	**Odds Ratio**	**95% CI**	**_p_-value**
Stigma					
Perceived public stigma	-.065	.316	.937	[.505-1.740]	.837
Personal stigma	-.344	.257	.709	[.428-1.173]	.181
Model Likelihood Nagelkerke R^2 = .168					
Hosmer & Lemeshow Goodness-of-fit Test: χ^2=7.02, _df_ = 8, _p_ = .53					
Constant	-2.304	1.028	.100	-	.025
Demographics					
Age	.073	.024	1.076	[1.026-1.127]	.002*
Gender	.208	.172	1.231	[.879-1.723]	.229
Psychosocial problems					
Distress	.293	.243	1.341	[.832-2.160]	.254
Alcohol risk	-.021	.196	.979	[.667-1.438]	.915
Attitude					
Attitude disclosure	.383	.077	1.466	[1.260-1.705]	<.001*
Attitude help-seeking	-.206	.286	.814	[.464-1.426]	.471
Stigma					
Perceived public stigma	-.267	.240	.766	[.478-1.226]	.266
Personal stigma	-.053	.195	.948	[.648-1.389]	.786
Model Likelihood Nagelkerke R^2 = .100					
Hosmer & Lemeshow Goodness-of-fit Test: χ^2=7.39, _df_ = 8, _p_ = .50					

Note: B= Logit parameter
*p=<0.05

Predicting disclosure
Attitudes toward disclosure and attitudes toward help-seeking behavior significantly predicted disclosure. The value of the odds of attitude towards disclosure indicates that as one's tendency to disclose increases, the odds of actual disclosure increases by a factor of 1.766. The student's attitude towards help-seeking behavior also contributes to the prediction of disclosure; as a students' tendency to seek help decreases, the odds of disclosure of mental health problems decreases by a factor of .417. The logistic regression model for disclosure did not improve by adding age and gender, distress and alcohol risk, and perceived public stigma and personal stigma.

Predicting help-seeking behavior

Age and attitude towards disclosure significantly predicted help seeking. Likelihood to seeking help increased by a factor of 1.076 per year of age. Further, the value of the odds of attitude towards disclosure indicates that, as one's tendency to disclose increases, the odds of actual help seeking increases by a factor of 1.466. Gender, distress and alcohol risk, perceived public stigma, and perceived public stigma and personal stigma, did not predict help seeking significantly.

DISCUSSION

The present study investigated predictors of disclosure and help-seeking behavior among students, and the main aim was to determine whether stigma and students' attitudes towards disclosure and help-seeking behavior, controlled for distress and hazardous alcohol use, predicted actual disclosure and help seeking. Our study showed five main findings: (a) as expected, participants in our study were a distressed group with over 56% reporting high levels of distress and over 20% reporting hazardous alcohol use; (b) overall, students experienced little stigma, and both perceived public and personal stigma did not significantly predict disclosure and help seeking; (c) although students showed a rather unfavorable attitude towards disclosure and help-seeking, and only a few actually disclosed or sought help, interestingly, students who reported mental health problems (i.e., both distress and hazardous alcohol use) showed the least favorable attitude to disclosure, but at the same time showed the most positive attitude toward help-seeking; (d) disclosure was significantly predicted by both attitude towards disclosure and attitude towards help-seeking behavior, indicating that a student is more likely to disclose when one has a favorable attitude to disclosure, and is less likely to disclose when the attitude toward help-seeking is low; and, (e) help-seeking was significantly predicted by a students' age and attitude towards disclosure: older students with higher intentions to disclose seek more help than other students.

The combination of high levels of distress and hazardous alcohol use in students in our study with low levels of disclosure and help-seeking is consistent with many previous studies as mentioned in the introduction. Our results also show consistency with a review by Eisenberg, Hunt, & Speer (2013), in which students did not seem to have deep-rooted attitudes towards disclosure and help-seeking behavior. Our finding on stigma was unexpectedly the opposite of previous studies by Golberstein, Eisenberg, & Gollust (2008) and Eisenberg et al. (2009), who found high levels of stigma among American student samples and reported that stigma was a significant predictor

of disclosure and help-seeking among students. This may be explained by cultural differences between American and European students, as students' stigma beliefs and attitudes are affected by the culture of the societies to which they belong. However, later studies suggested that traditionally emphasized barriers such as stigma 'clearly are not the entire story' and that it is possible that stigma takes more subtle forms, like self-stigma within university, which asks for a closer look in future research (Eisenberg et al., 2012, 2013). More recent studies demonstrated that not stigma, but intention to seek help was the most influential predictor of the utilization of mental health services (Li et al., 2018; Li, Dorstyn, & Denson, 2016). Although our results do not support this finding directly, they did point in the same direction: help-seeking was predicted by attitudes to disclose, which are preceded by intentions.

Perhaps our results could be explained by identified barriers for disclosure and help-seeking in the Health Belief Model (HBM), such as a lack of perceived need for help, which refers to the individual's subjective experience that there's a mental health concern (Hunt & Eisenberg, 2010; Romanson, 2018). When making decisions about disclosure and help-seeking, recognition of the problem is conditional. According to Corrigan et al. (2016), the tendency to disclose and seek help is also associated with identity: more distressed students are more likely to identify themselves as someone with mental health problems, which in turn is associated with the tendency to disclose. As university students often experience first onset of mental health problems during university, many may be unaware that they have mental health problems that would benefit from counseling or treatment (Eisenberg et al., 2009; Kessler et al., 2005) which makes it difficult to recognize symptoms and to identify oneself as a person with mental health problems. Research by Coles & Coleman (2010) and Cheng, Wang, McDermott, Kridel, & Rislin (2018) showed that individuals with higher levels of mental health literacy (e.g., ability to recognize symptoms and correctly attribute them to mental illness) are more likely to seek psychological help. This could explain why in the present study the number of students with distress was high, but their intention to disclose and seek help was not: they might have low levels of mental health literacy. Individuals with low levels of mental health literacy often believe that their problem is transitory (Downs & Eisenberg, 2012).

Even if students indicate a need for help, they might still maintain negative attitudes towards help-seeking that holds them back from actual help-seeking (Li et al., 2016). For instance, there is growing evidence that points out that problematic alcohol use is a particularly severely stigmatized condition and that the threshold for help-seeking is high for problematic drinkers because of shame and negative connotations

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regarding addiction health care (Schomerus et al., 2011). Furthermore, studies show that many students were unaware of services or insurance coverage, and that they experience skepticism about treatment effectiveness, which, according to the Health Belief Model, hinders their belief in benefits of changing their behaviors (Eisenberg et al., 2009). This may also be an explanation for our results on little disclosure and help-seeking. Another explanation is consistent with the HBM's belief of social barriers and stigma. Although students in the present study did not report high levels of stigma, it is possible that they experienced social difficulties, like not wanting to burden others or have anyone to talk to, or having concerns about negative effects on their academic records, as reported in previous research (Chew-Graham, Rogers, & Yassin, 2003; Downs & Eisenberg, 2012). Such concerns could act as a significant barrier to help seeking, particularly if the student perceives faculty staff as being the only people within the university who they can seek help from regarding mental health problems.

Students with mental health problems seek help from nonprofessionals, particularly peers, more frequently than from professionals (Corrigan et al., 2016; Eisenberg et al., 2012; Romanson, 2018). This could explain why our results showed little help seeking from professionals, were it not for the fact that students in the present study also showed low levels of disclosure within their inner circle. Indeed, significantly higher levels of help seeking were found among students with severe mental health problems. Research has indicated that individuals who conceal distressing information are more likely to have negative help-seeking attitudes and that significant others' expectations may influence students' attitudes toward, and sense of control about, accessing services (Li et al., 2018).

What could explain the lack of disclosure of students towards their family and friends, even when they experience high levels of distress for which they do seek professional help? According to our results stigma does not seem to play a determinant role, so can this be the result of other social pressure? Recent reports show an increase in perceived performance pressure and silent loneliness among students (The Council for Health and Society, 2018; RIVM, 2017). Students experience high expectations to succeed, and go through great lengths to meet up to these expectations, which they do not experience from their own family infrequently. They feel ashamed and that they don't belong if they can't comply. It seems relevant to further look into the possibility that this contributes to students' withholding to disclose, even within their inner circle.

LIMITATIONS

Although this study shows valuable insights in attitudes towards disclosure and help-seeking behavior as predictors of actual disclosure and help seeking among students, our findings must be considered within the context of its limitations. With regard to the cross-sectional nature of this study, causality may run in both ways. For example, a negative attitude towards disclosure may inhibit help-seeking behavior, but at the same time, little help-seeking may lead to a negative attitude towards disclosure. Longitudinal studies are needed to investigate these possible causalities.

Although the screening instruments used in the present study are also indicative for being at risk for disorders, we can't confirm the presence of these disorders. This makes it more difficult to compare our results to those of other studies in which students with mental health disorders were specifically investigated. Because both groups appear to experience barriers towards disclosure and help seeking, future research could incorporate both effects of undiagnosed symptoms and disorders to gain more insights into the underlying processes.

Our results showed some help-seeking among students who did not report symptoms of distress or hazardous alcohol use according to our screeners. Therefore it seems likely that they experienced other problems that we did not investigate. The supported HBM model in the present study may need to be replicated in future studies with additional psychosocial problems.

This study was conducted among a sample of students at a university of applied sciences with a mainly white population, which may increase the potential for selection bias and therefore may affect the generalizability of the study results to more diverse university populations. However, the large size of our random sample contributed to the reliability of the study results.

IMPLICATIONS FOR PRACTICE

The present study has important implications for enabling factors that contribute to disclosure and help seeking among students. It implies that new approaches to help-seeking interventions may be useful. Whereas interventions for increasing disclosure and help-seeking are currently mainly aimed at stigma reduction and screening and linkage programs, our results show that stigma and screening are not the entire story. Disclosure and seeking help for mental health challenges are health

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promoting competencies, and it seems that related attitudes and awareness of one's own mental health need more attention in university students to enhance these competencies. In order to promote disclosure and seeking help behaviors, we suggest to promote mental health literacy and to increase available resources for students and the awareness regarding these resources. Mental health literacy, by definition, encompasses the ability to differentiate a mental health condition from general stress, and knowledge and beliefs about risk factors and available professional help (Cheng et al., 2018; Jorm et al., 1997). For example, the Teen Mental Health school-based mental health literacy intervention for adolescents showed promise regarding knowledge of mental health in a university student population (Milin et al., 2016). Further, reducing social barriers such as performance pressure and silently feeling ashamed as one can't live up to experienced expectations seem important targets when improving students' disclosure and help-seeking behaviors.

By improving personal knowledge about mental health problems and related attitudes and behaviors, education-based programs, like Teen Mental Health, could increase the likelihood of disclosure and help-seeking behaviors among university students (Sontag-Padilla et al., 2018). To promote students' engagement in mental health literacy programs, the use of expert peers by experience is advised, as well as making mental health literacy part of the curriculum. In order to break down social barriers, universities should invest in an open, supportive study environment, in which seeking help is seen as normal, which would suit the experience of many students that university is a challenging time.

CONCLUSIONS

Although psychosocial problems seem highly prevalent among students, there is little intention to disclose or seek help for dealing with these issues. Perhaps surprisingly, both perceived public and personal stigma were not found to be significant barriers for disclosure and help-seeking. Not only did students experienced little stigma, it also did not predict disclosure or help-seeking. Although the results indicated that students showed not very positive attitudes toward help-seeking, these attitudes did predict actual disclosure and help-seeking behavior. Many universities have adopted stigma-reduction campaigns to facilitate treatment use, but our results call attention for the need for additional interventions aimed at attitudes towards disclosure and help-seeking and awareness of one's own mental health, like the enhancement of mental health literacy. Educating students about mental health issues and available mental health services may increase the likelihood of disclosure and help-seeking behaviors.

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CHAPTER 6

General Discussion

Gonna rise up
Find my direction magnetically

Rise
Eddie Vedder (2007)

The overall aim of this dissertation was to provide insight into the characteristics of students with psychosocial problems and the valid and reliable assessment of these characteristics. Another aim was to provide insight into the association between students' psychosocial problems and academic delay and dropout. Furthermore, this dissertation aimed to provide insight into predictors of students' psychosocial problems as well as disclosure and help-seeking behavior when these problems occur.

SUMMARY OF THE MAIN FINDINGS

Chapter 2 describes the results of a study that examined the impact of performance pressure, loneliness, and sense of belonging on the underlying dimensions of burnout (i.e., emotional exhaustion, depersonalization, and personal accomplishment). Although the concept of burnout was originally defined in the context of work-related stress, this traditional concept and its scope have recently been broadened to include study-related problems. The study sample consisted of 3,141 students of a university of applied sciences (*M* age = 21.8, *SD* = 3.45, 60% female, 40% male) who completed an online survey entitled Study Environment, Health, and Study Success. This survey included questionnaires regarding performance pressure, loneliness, sense of belonging, and burnout. The results of this study revealed that symptoms of burnout and loneliness were highly prevalent and that more than 75% of all students experienced high levels of performance pressure. Furthermore, students reported varying degrees of their sense of belonging with respect to their study environment. Path analysis showed that performance pressure and loneliness were significantly associated with the three dimensions of burnout, but the strongest significant predictor appeared to be sense of belonging. Results suggest that sense of belonging could be targeted as a candidate for enhancing student wellbeing with the aim to improve their ability to cope with the high demands of student life and to prevent burnout.

In **Chapter 3** the concurrent validity of the Alcohol Use Disorder Identification Test – Consumption (AUDIT-C) was examined in a sample of students in order to determine the most appropriate cutoff points. Hazardous drinking is a growing concern among students in higher education, as alcohol use increases students' risk of dropout and alcohol dependence, and it is the leading cause of injury and death among students. The AUDIT-C is the abbreviated version of the AUDIT, a screening instrument for measuring hazardous alcohol use among the adult population, developed by the World Health Organization (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). So far, a gold standard for identifying high-risk drinking students in higher education

has been lacking, and there has been little evidence for the concurrent validity of the AUDIT-C as a screening instrument for this group. Cross-sectional data were used taken from health surveys held among 5,401 students at a research university and a university of applied sciences in the Netherlands. Receiver operating characteristic (ROC) curves, sensitivity, specificity, and positive and negative predictive values for different cutoff scores of the AUDIT-C were calculated using the full AUDIT score as criterion. Results of this study revealed that AUDIT-C appears to be valid in terms of identifying hazardous and harmful drinking students, with suggested optimum cutoffs 7 (females) and 8 (males). However, considerations regarding avoiding false-positives versus false-negatives, in relation to the type of intervention following screening, could lead to the selection of different cutoffs.

Chapter 4 examined whether students' psychosocial problems, self-esteem, and personality profiles could predict academic delay and dropout. Delay and dropout are a major problem among students in higher education, and there are also growing concerns that many students experience psychosocial problems. Although the cross-sectional correlation between students' problems and academic delay and dropout is well established, less is known about longitudinal relationships. In this longitudinal study, a prediction model based on symptoms of anxiety, depression and hazardous alcohol use, self-esteem and anxiety sensitivity, hopelessness, impulsivity and sensation seeking was developed based on data on a freshmen cohort (n = 962, M age = 20.8, SD = 5.2, 41.4% male, 58.6% female). The model was validated with data on a second freshmen cohort (n = 520, M age = 19.3, SD = 2.8, 36.2% male, 63.8% female). An interesting finding was that no significant relationship between psychosocial problems, i.e., anxiety, depression, and alcohol (mis)use, and delay or dropout was found, while a brief inventory of personality risk profiles (SURPS) did in fact contribute to the prediction of delay and dropout. However, the findings also suggest that delay and dropout are not easily predicted exclusively on the basis of freshmen problems and personality profiles. Future research may add other personality characteristics, psychosocial problems, and factors such as resilience. Nevertheless, universities are advised to develop and test screening tools for the early identification of at-risk students and to implement preventive student wellbeing programs that may promote students' mental health and subsequently combat delay and dropout.

Chapter 5 examines predictors of students' disclosure and help-seeking behavior based on students' perceived public and personal stigma, and it examines students' attitudes towards disclosure and help-seeking behavior. The sample consisted of 1,791 students of a university of applied sciences in the Netherlands (M age = 21.5,

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SD = 3.8, 41.3% male, 58.7% female) who completed the online survey entitled Study Environment, Health and Study Success. This survey included questionnaires regarding stigma, disclosure and help-seeking attitudes, and behavior. Results showed that the participants were a distressed group with prevalent hazardous alcohol use who experienced little perceived public and personal stigma and had rather unfavorable attitudes towards disclosure and help-seeking. Accordingly, this group showed little actual disclosure and help-seeking. Results of the analysis of variance and the logistic regression analysis indicated that perceived public and personal stigma did not predict disclosure and help-seeking behavior, but that attitudes towards disclosure and help-seeking did. Disclosure and seeking help for mental health challenges are health promoting competencies that would appear to need greater attention in university students. Although further research needs to validate these findings, it is recommended to promote disclosure and help-seeking behavior among students by investing in mental health literacy programs.

REFLECTION ON THE MAIN FINDINGS AND FUTURE DIRECTIONS

Overall, the dissertation's main findings and recommendations for future directions concern four major themes: *valid and reliable screening and assessment*, *disclosure and help-seeking*, *implications for interventions,* and *further implications for (higher) education and policy*.

Valid and reliable screening and assessment

Over the past few years, several studies have indicated that mental health problems are highly prevalent among students (Auerbach et al., 2016; Dyrbye et al., 2008; Kypri, Cronin, & Wright, 2005; Newcomb-Anjo, Villemaire-Krajden, Takefman, & Barker, 2017; Reyes et al., 2016; Stolker & Lafreniere, 2012; Tosevski, Milovancevic, & Gajic, 2010). These findings are in line with earlier indications of prevalent mental health problems among students in studies, that were part of a long-term student wellbeing project leading up to this dissertation (Dopmeijer, 2018), but also in the studies included in the current dissertation. Despite a recent study by Van der Velden, Das, and Muffels (2019), in which the authors state that there is an absence of evidence for the *increase* of mental health problems among students, in my opinion, the growing concern regarding the high prevalence of problems remains valid, irrespective of whether or not this concerns an actual increase. However, an important perspective on students' psychosocial problems seems to remain underexposed in the scientific literature and in screening and assessment: the impact of the crucial developmental period of emerging adulthood. After all, in contemporary society, emerging adults spend most

of their time at university; therefore, students' psychological and identity development coincides with challenging university life. As stated before, many emerging adults experience this transitional period as difficult and stressful (Erikson, 1968; McLafferty et al., 2017; Niazi & Mehmood, 2017; Stolker & Lafreniere, 2012). Building on the work of Erikson, Chickering established his renowned Psychosocial Theory of Student Development (Chickering, 1969; Chickering & Reisser, 1993), in which he argues that being a student at university creates specific circumstances for emerging adults in which they face extra developmental challenges. His theory describes specific study-related developmental tasks that students must complete *while* developing their identity (Liversage, Naudé, & Botha, 2018). These developmental tasks concern 1) moving through autonomy to interdependence, 2) establishing a coherent self-image, 3) developing purpose, which encompasses professional aspirations as well as personal interests and interpersonal commitments, and 4) managing emotions, which includes awareness of emotional reflexes and conscious expression (Chickering, 1969; Chickering & Reisser, 1993; Chickering & Braskamp, 2009).

From the outcomes of the first study on the development of burnout symptoms, it was argued that contextual factors, i.e., performance pressure, loneliness, and sense of belonging, also have a significant impact on the development of problems. Perhaps more strongly now than in the past, student life is about meeting high expectations: getting good grades, building a resume, ensuring a good career start, and having a rich social life (The Council for Health and Society, 2018; RIVM, 2017). This can be discussed in the light of Paul Verhaeghe's views on the consequences of today's society, which over the past few decades has shown an increasing degree of individualization and performance pressure (Verhaeghe, 2018). Verhaeghe states that a society that relies on individualization and competitive drive (i.e., performance pressure) witnesses an increase in the number of people who suffer from several psychological problems such as social anxiety, depression, burnout, and loneliness. This societal development seems to have a particularly strong effect on emerging adults, who are in the midst of personality and identity development. Therefore, performance pressure, loneliness, burnout symptoms, and other psychosocial problems would appear to be rooted not only within students' developmental stages and the educational environment, but also in a broader societal context.

Taken together, the three factors mentioned above (i.e., the stage of identity development, the specific circumstances and university tasks, and societal pressure) suggest that it is likely that, compared to their non-studying peers, students have specific characteristics. Research indicates that these specific characteristics apply even

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more strongly to first-generation students (Liversage et al., 2018), informal caregiving students (Tienen, Boer, Roos, Heijde, & Vonk, 2016), international students, and students who identify as a member of the LGBTQ community (Kelders, Oberschmidt, & Bohlmeijer, 2019). This consideration is highly relevant for the assessment of students' psychosocial problems. The outcomes of the third study (Chapter 4) appear to form a first step towards the justification of this consideration. On the basis of prior research, it was expected that students' psychosocial problems would predict their degree of academic delay and dropout. However, prediction models in this study showed the opposite. Interestingly, these same analyses showed that risky personality traits, i.e., anxiety, sensitivity, and hopelessness, *did* contribute to the prediction of dropout. A more detailed look at the prediction of delay and dropout will be taken later in this section. The predictive value of personality traits or profiles seems to indicate that it is highly relevant to look mainly at specific personality traits that are either risk-increasing or protective before problems arise and, subsequently, delay or dropout are experienced. Therefore, it is important to gain a better understanding of the many changes that students go through at university, how these impact students' development, and what makes this problematic for some students, something which may eventually lead to internalizing or externalizing problems. An important question that arises is whether the current screening and assessment tools for psychosocial problems among students are sufficiently discriminatory for life phase problems.

Although it seems plausible that the screening and assessment standards for several psychosocial problems could differ from regular standards (i.e., related to stress, burnout, anxiety, and depression), for this dissertation we mainly focused on the valid screening of hazardous alcohol use. This use was found to be highly prevalent (i.e., 88% of all students met conventional criteria for hazardous drinking) and associated with delay and dropout in studies that preceded this dissertation (Dopmeijer, 2012, 2018). So far, no gold standard for identifying hazardous drinking students has become available. The second study, described in Chapter 3, also showed that the AUDIT-C cutoff score of 4 for the general adult population (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) led to many false-positives among students. However, the ROC curves and sensitivity analysis results showed a good concurrent validity for the AUDIT-C as a screening instrument for hazardous drinking among students in higher education, with specific cutoffs of 7 for women and 8 for men that determine eligibility for further alcohol assessments. Therefore, the AUDIT-C with these specific student cutoffs is recommended as a valid screener for identifying hazardous alcohol use among students in higher education.

Although a well-supported suggestion for a valid and reliable screening instrument has now been made, an interesting paradox remains that might hinder further actions towards prevention: research has shown that hazardous drinking among students is a growing concern because of its many and severe physical, psychological, and study-related consequences, but in practice student drinking is often downplayed as a result of the socially accepted idea that high levels of alcohol use are simply part of student culture. Although many students show a natural recovery after a peak of drinking, often without specific treatment (Misch, 2007; Sher, Grekin, & Williams, 2005), some students develop alcohol use disorders (AUDs), likely because they are trying to cope with high study demands or other difficult life circumstances by drinking. Although the need for prevention of hazardous alcohol use is mainly recognized for adolescents up to the age of 18 (Rijksoverheid, 2018), there is also a need for prevention of hazardous alcohol use among young adults, including students. More fundamentally, we need to stop downplaying hazardous alcohol use among university students, organize school-wide or class-wide screening, and take preventive measures within the university context (e.g., the prevention of alcohol use within the university), all of which should be imbedded in proper alcohol policies (De Jonge & Bovens, 2020). Based on the well-known potential for negative labeling and stigmatization when identifying adolescents (Lammers, 2019), which is likely to be the same for at-risk students, screening must be handled carefully. Besides, with the knowledge of low response rates in surveys, there is a general need for increasing the level of engagement of students in the screening and assessment of all psychosocial problems. To this end, opt-out screening is suggested. This means that screening will be carried out among all students unless students actively choose to unsubscribe.

The valid and reliable screening and assessment of student wellbeing concepts is also fundamental for the prediction of students' academic delay and dropout. Previous studies have shown that mental health issues can have a serious impact on academic performance and may subsequently lead to academic delay and dropout (McLafferty et al., 2017; Zivin, Eisenberg, Gollust, & Golberstein, 2009). However, results of the prediction modeling analyses in Chapter 4 showed that, despite the prevalence of problems among our student freshmen samples, no significant relationship was found between psychosocial problems and delay and dropout. When we added personality profiles to the prediction model, results showed that these did in fact contribute to the prediction of delay and dropout. This might be explained by the fact that these profiles are present before associated psychosocial problems evolve, and that they predict a further development of (precursors of) these problems. However, the probability analyses showed that the probability of mainly delay, but also dropout,

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is not easily predicted based on freshmen problems and personality profiles only. Study delay, perhaps more so than dropout, may be affected by factors that were not included in the current prediction model. It is also possible that delay cannot (easily) be predicted solely on the basis of freshmen data. Elaborating on both the perspective of personality development and the network approach for psychopathology, it seems plausible that protective factors, such as sense of belonging, engagement, and resilience, may contribute to decreasing students' chances of delay and dropout. For example, in the network theory, resilience is described as the possibility to quickly return to one's stable state of mental health after a weak network of symptoms has been activated (Borsboom, 2017). Engagement and resilience are also upcoming research topics in scientific student wellbeing literature (Chung, Turnbull, & Chur-Hansen, 2017; Kelders et al., 2019; Scheffer et al., 2018). They are also in line with the aforementioned Theory of Psychosocial Development proposed by Erikson (Erikson, 1968) and the Psychosocial Theory of Student Development formulated by Chickering (Chickering, 1969; Chickering & Reisser, 1993), which states that the mature identity development of a student is the result of successful developmental task completion, such as managing emotions including an adequate response to stress, in which engagement and resilience seem to be essential. Therefore, in order to enhance the valid and reliable screening and assessment of psychosocial problems and the subsequent prevention of academic delay and dropout, the addition of personality profiles and protective factors, such as resilience, seems highly relevant.

Finally, we came across significant differences in the scientific literature regarding the conceptualization and interpretation of psychopathology among students. Many studies on the assessment of psychopathology among students concern the assessment of mental health disorders; this limits the scope, as there are many students who experience symptoms from which they suffer, but who do not have a mental disorder. These differences may impede a clear understanding of students' mental health problems, i.e., the overall interpretation of adequate prevalence rates and the severity of problems, although this understanding is important in order to offer students the right form of assistance. A recent and promising approach that is suggested to fill this gap is that of the network approach to psychopathology, according to which mental disorders arise from direct interactions between symptoms rather than through a latent (brain) disease (Borsboom, 2017; Borsboom, Cramer, & Kalis, 2019). These direct causal interactions between symptoms may be grounded in biological and psychological processes as well as in societal norms. For example, adverse life events or relatively less severe experiences such as test anxiety may activate the symptoms in the network (e.g., exhaustion or feelings of being depressed).

This model is an explanatory model for mental disorders as well as associated concepts such as mental health, resilience, and vulnerability (Borsboom, 2017). The network approach to psychopathology seems highly relevant for student wellbeing, since it is also suitable for students for whom addressing symptoms (e.g., test anxiety or stress) with low-threshold interventions may be more acceptable than treatment for mental disorders (Cuijpers et al., submitted). Such interventions may be preferred instead of treatment for mental disorders (e.g., cognitive behavioral therapy to change the network structure through modification of the symptom connections), which is not something many students recognize.

Disclosure and help-seeking

The high prevalence of psychosocial problems among students would be less concerning if students were receiving appropriate treatment (Hunt & Eisenberg, 2010). Instead, consistent with previous studies, the findings reported in Chapter 5 indicated that students hardly ever disclose their mental health issues, and among them only a few seek help. This is worrying, as it is well known that these problems tend to worsen if left untreated (Duffy, Twenge, & Joiner, 2019). Although previous studies indicated that traditionally emphasized barriers such as stigma 'clearly are not the entire story' (Eisenberg, Hunt, & Speer, 2013), interventions for increasing disclosure and help-seeking are currently still mainly aimed at stigma reduction. The current findings confirmed that stigma is indeed a barrier for disclosure and that help-seeking does not seem to be the entire story. In fact, students in our sample experienced *little* perceived public and personal stigma, whereas in previous studies, despite indications for other barriers for disclosure and help-seeking, the experienced stigma was more severe (Eisenberg, Downs, Golberstein, & Zivin, 2009; Eisenberg, Hunt, & Speer, 2012, 2013; Golberstein, Eisenberg, & Gollust, 2008; Hunt & Eisenberg, 2010). It is possible that stigma in a more subtle form, such as self-stigma (i.e., negative attitudes towards oneself), could be a contributor to a lack of disclosure and help-seeking (Eisenberg, Downs, Golberstein, & Zivin, 2009; Eisenberg, Hunt, & Speer, 2012, 2013; Golberstein, Eisenberg, & Gollust, 2008; Hunt & Eisenberg, 2010). Students' views on other students who experience psychosocial problems and use mental health treatment may differ from how students view themselves in the same situation: possibly, students are more judgmental towards themselves if they experience problems which they feel ashamed of. This calls for further research. Another possible explanation could be that thanks to the increasing attention for student wellbeing in the Netherlands and the development of the Action Plan for the Enhancement of Student Wellbeing, in which an overall approach for student wellbeing within higher education is proposed (Dopmeijer et al., 2018), students feel more readily seen, heard, and understood, and

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therefore experience less stigma from the public or within themselves towards other students.

The current results also showed that students have rather unfavorable attitudes towards disclosure and help-seeking, which appeared to be significant predictors of actual disclosure and help-seeking. As students often experience the first onset of mental health problems during their time at university, many may be unaware that they have (symptoms of) mental health problems that could benefit from counseling or treatment. This raises the question whether at-risk students know when they would need help. In Chapter 5 we argued that being unaware of one's problems could perhaps be explained by students' low levels of mental health literacy, as this is an important health promoting competency, i.e., the ability to recognize symptoms and correctly attribute them to mental illness (Cheng, Wang, McDermott, Kridel, & Rislin, 2018). Whereas individuals with higher levels of mental health literacy are more likely to seek help (Cheng et al., 2018), individuals with low levels of mental health literacy often believe that their problem is transitory (Downs & Eisenberg, 2012). At the same time, the experience of barriers in disclosure and help-seeking are also likely to be related to students' developmental stage and their aforementioned experience of high societal expectations to succeed, which make them go to great lengths to live up to these expectations. Students feel ashamed if they cannot comply, which could contribute to not seeking help or seeking help only at a later stage.

Students may view help-seeking as a threat to their newly-established sense of autonomy (Divin, Harper, Curran, Corry, & Leavey, 2018), or they have concerns about negative effects on their academic records (Chew-Graham, Rogers, & Yassin, 2003; Downs & Eisenberg, 2012). This might explain why we found that students with mental health problems more frequently seek help from non-professionals, particularly peers and family, than from professionals, which was consistent with findings reported in previous studies (Corrigan et al., 2016; Eisenberg et al., 2012; Romanson, 2018).

Research also showed that students with mental health problems are more likely to seek help if they feel that there is an open and supportive study environment with respect to mental health (Sontag-Padilla et al., 2018). These results seem to be in line with findings from the first study reported in this dissertation (Chapter 2) in which the sense of belonging (i.e., feeling at home in the study environment) appeared to be a protective factor in terms of the development of burnout symptoms. Our preliminary studies indicated that an increasing number of students in the Netherlands started living off campus after the student finance system was changed from a grant system

to a student loan system in 2015, and that they commute to campus. This could inhibit opportunities for academic and social integration, which is conditional for a higher sense of belonging (Stebleton, Soria, & Huesman, 2014; Tinto, 1999). Therefore, it seems vital that universities address the sense of belonging of students as part of the enhancement of students' mental health and wellbeing. All in all, in order to bridge the gap between the need for mental health treatment among students and students actually receiving it, a combination of individual and contextual interventions is likely to be the most effective, and therefore it is suggested to focus on the enhancement of both students' mental health literacy and their sense of belonging.

Implications for interventions

From the current findings, an important way forward is to apply these findings to the development of interventions targeting students' wellbeing and subsequently their academic performance. The extensive investigation of characteristics of students with psychosocial problems and the valid and reliable assessment of these characteristics, combined with the study of contextual predictors of both psychosocial problems and disclosure and help-seeking behavior, has improved our understanding of the impact of challenging student life on wellbeing and academic performance.

So far, interventions have mainly had a curative aim targeting social and emotional adjustment, behavioral adjustment, and internalizing symptoms (e.g., stress management techniques, mindfulness, and cognitive behavioral therapy). Such interventions have shown positive effects on the wellbeing of students (Douwes, Evenboer, Krediet, & Metselaar, 2019; Goldberg et al., 2019). However, the findings reported in the current dissertation provide new (additional) insights and directions for interventions. More specifically, they demonstrate that there might be three key targets for intervention: (1) risk reduction of psychosocial problems and delay and dropout, (2) enhancing mental health promoting competencies, and (3) enhancing the study environment. These interventions can be categorized as *individual* (individual intensive tailored support), *targeted* (cohorts with specific needs or vulnerabilities), and *universal* (all students, building preconditions for wellbeing) tiers (Victoria State Government, 2018).

The first future target for interventions is the risk reduction of psychosocial problems and delay and dropout at the individual and targeted level, based on two main findings in this current dissertation. First, consistent with previous studies, current findings demonstrated that hazardous drinking is highly prevalent among students and that the AUDIT-C appears to be a valid screening instrument for identifying

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students at risk for alcohol use disorder (AUD). Therefore, it is recommended to apply the AUDIT-C as a screening instrument for students, with optimum cutoffs of 7 (males) and 8 (females) as suggested in Chapter 3, to refer them to further alcohol assessments and subsequently, if needed, to organize appropriate interventions. However, depending on the intervention selected and the need to avoid either false-positives or false-negatives, there could be a reason to select different cutoffs. For interventions that require a great deal of time and resources, such as counseling from the student psychologist, false-positives need to be avoided. From the current results, in this case, cutoff scores of 8 in females and 9 in males appear to be the most suitable. The optimum cutoffs of 7 (males) and 8 (females) as suggested in Chapter 3 concern the situation in which avoidance of false-negatives may be preferred for interventions with low cost and little personal effort, such as providing information on hazardous drinking risks or self-guided online interventions (Riper et al., 2018). A good example of a brief intervention on the targeted level is Preventure, an existing school-based preventive program that targets young adolescents who demonstrate known prospective risk factors: early onset of alcohol use and personality risk of alcohol abuse (Lammers, 2019). The program has three main components: (1) psycho-education, (2) behavioral coping skills, and (3) cognitive coping skills (Conrod, Stewart, Comeau, & Maclean, 2006) and is adapted to the four personality profiles for substance abuse: anxiety sensitivity, negative thinking, impulsivity, and sensation seeking (Lammers, 2019). Several studies have shown the effectiveness of the Preventure program on hazardous alcohol use among young adolescents (Conrod, Castellanos-Ryan, & Strang, 2010; Conrod et al., 2006; Newton et al., 2016). Although there may be differences between young adolescents and studying emerging adults (most students are 18 years or older and therefore legally entitled to drink, and secondary school drinking culture may be different from university drinking culture), the components of the personality-based Preventure program, possibly adapted, may be relevant for students as well. Reasons to believe in the relevance of the Preventure approach for students are also found, interestingly, in Chapter 4 where results of prediction modeling for delay and dropout also pointed in the direction of personality-based interventions as a promising means for reducing delay and dropout, as results in that chapter showed that students who are mainly at risk for dropout showed specific personality traits, e.g., anxiety sensitivity and hopelessness. These traits were assessed with the Substance Use Risk Profile Scale (SURPS), which is the assessment instrument used for identifying Preventure program eligible youth and their personality profiles (Woicik, Stewart, Pihl, & Conrod, 2009). Although the scale was originally and exclusively aimed at assessing substance abuse vulnerability, it is currently also used as a broader risk personality screener for mental problems among adolescents, such as the other most common

mental health disorders anxiety and depression, both of which have been shown to be associated with the personality dimensions of the SURPS (Henges & Marczinski, 2012; Krank et al., 2011; Malmberg et al., 2010; Pulkkinen & Pitkanen, 1994; Sher, Bartholow, & Wood, 2000; Woicik et al., 2009). Taken together, based on the findings that hazardous drinking students, who can be identified with the AUDIT-C, as well as students at risk for delay and dropout are likely to benefit from personality-based interventions, it seems relevant to further investigate the relevance for an adapted student version of the original Preventure program that could target not only hazardous alcohol use, but anxiety and depression symptoms as well.

A second future target for interventions concerns the enhancement of health promoting competencies at the universal level. This target is based on the outcomes of the fourth study (Chapter 5) regarding students' low levels of disclosure and help-seeking behavior. Whereas interventions for increasing disclosure and help-seeking are currently mainly aimed at stigma reduction, screening, and linkage programs, our results showed that stigma and screening are not the entire story. Our results implied that, as university students often experience the first onset of mental health problems during their time at university, many may be unaware that they have mental health problems that would benefit from counselling or treatment (Eisenberg et al., 2009; Kessler et al., 2005); this may be due to low levels of mental health literacy. Mental health literacy is considered to be the foundation for mental health promotion, early identification of mental health problems, and subsequently intervention and continuing care (Kutcher et al., 2016). Disclosure and help-seeking behavior are health promoting competencies that are part of one's mental health literacy. It is therefore recommended to invest in students' mental health literacy programs such as, for example, the Teen Mental Health school-based mental health literacy intervention for adolescents that is particularly promising in terms of promoting knowledge of mental health in a university student population (Milin et al., 2016). These programs have shown to be effective in empowering students so that they can take better care of themselves and their loved ones in terms of mental health by increasing their understanding about mental health, risk signs, and disorders, by increasing resilience, decreasing stigma, and enhancing help-seeking efficacy, and by teaching them skills regarding disclosure and help-seeking. It is important to view mental health literacy programs as universal, as mental health literacy consists of important life skills, such as resilience, that far exceed students' time at university. These programs are an excellent example of how schools and universities may prepare students well for life. To promote students' engagement in mental health literacy programs, the use of peer experts by experience is advised. An important note here is the need to be aware of

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the risk associated with wellbeing interventions, namely that some students may not find these to be beneficial and that some may see wellbeing activities as yet another obligation (Ishak et al., 2013). This is why, ideally, student wellbeing interventions in general should be woven into the curriculum, as has been done in the Teen Mental Health approach, instead of being created as a stand-alone student wellbeing intervention program (Ishak et al., 2013).

A study that was part of the wellbeing project that led to this dissertation concerned students' motives for engaging in an online anxiety and depression intervention. This revealed that students were motivated to participate on the moment that they were made aware of, or were confirmed in their problems through receiving personalized feedback on their assessment outcomes, which justified their need for help (Boele, 2019). On the one hand, this seems to endorse the need for enhancement of mental health literacy, but on the other hand it also indicates students' uncertainty and vulnerability when it comes to seeking help. Therefore, besides the enhancement of mental health literacy, it is of fundamental importance that students receive feedback on their mental health outcomes as part of screening and assessment in order to enhance engagement in wellbeing programs, regardless of the outcome: positive feedback also educates students about their mental health and can be a welcome encouragement in challenging university life. Furthermore, in general, a more universal and preventive approach to student wellbeing appears to be more valuable and effective than an approach that is mainly curative. Student wellbeing should be about *all* students, not only students with mental disorders. This is also in line with the aforementioned recommended exploration of the application of the network approach for psychopathology for the student population, which is both focused on *assessment* of networks of symptoms as well as on targeted *interventions* for both symptoms and disorders. The application of this network approach could contribute to a shift from disorders to symptoms, and therefore to early recognition and a more preventive approach. Lastly, our findings show that an investment in mental health literacy to enhance disclosure and help-seeking, and subsequently to enhance engagement in wellbeing interventions, is probably not enough. The students' experience of a safe and open study environment in which they feel at home contributes to breaking down barriers when it comes to disclosure and help-seeking.

This brings us to the third future target for interventions: the enhancement of the study environment. The recommendation of this target for interventions is based on results reported in Chapter 2, which showed that performance pressure, loneliness, and (a lack of) a sense of belonging are significant predictors of burnout symptoms among

students. These results were in line with those listed in several earlier studies, which already indicated that the sense of belonging was likely related to student mental health, motivation, academic performance, and the continuation of studies (Fink, 2014; Freeman, Anderman, & Jensen, 2007; Hausmann, Schofield, & Woods, 2007; Meeuwisse, Severiens, & Born, 2010; Mounts, 2004; Osterman, 2007; Thompson, Wood, & Davis MacNevin, 2019; Tinto, 2012). Having a sense of belonging is a fundamental human need and is therefore seen as an important condition for learning, since learning is generally not considered to be an individual, but rather a social process that takes place through connection and collaboration. Bakker, Hakanen, Demerouti, & Xanthopoulou (2007) found that resources such as social support and appreciation enhance the sense of belonging and mitigate the negative effects of high performance pressure and loneliness. Giving young students the opportunity to grow and flourish in a positive study environment while being in the midst of a crucial developmental stage with high demands involves a significant investment in terms of student wellbeing, an increase in the number of students who complete higher education degrees, and also the health and wellbeing of future generations (Ishak et al., 2013). Although performance pressure and loneliness are important contextual factors that influence students' wellbeing and functioning, an important basis for less engaged students may lie in the extent to which they feel that they belong in the classroom or at university in general (Freeman, Anderman & Jensen, 200; Strayhorn, 2012; Zumbrunn, McKim, Buhs, & Hawley, 2014). Therefore, it is suggested to emphasize a sense of belonging as en element of the third target for interventions on the universal level, without losing sight of the related and highly relevant concepts of performance pressure and loneliness. Investing in a sense of belonging and connectedness is a preventive target for interventions that could counteract the burden that students feel from the high demands in student life and that they experience as emerging adults in an individualized performance-oriented society. In more concrete terms, this means that it is recommended to invest in greater possibilities for interaction with classmates and teachers, both in and outside the classroom (Osterman, 2007). This calls for a didactic approach in which there is much room for cooperation, such as in project groups or learning communities. Furthermore, focusing on increasing social cohesion in each classroom also leads to a greater sense of belonging and has positive effects on wellbeing (Slavin, Schindler, & Chibnall, 2014). Extracurricular activities during university for both students and teachers as well as specific attention for social and academic integration during the introduction period of new students could also contribute to greater degrees of interaction and thus the feeling of belonging. Furthermore, although the effect was small, a study by Hausmann, Schofield, and Woods (2007) showed that when students are aware that they are part of a community, their sense of belonging increases. Sense of belonging

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within a university setting is mainly fostered within supportive classrooms (Freeman et al., 2007; Zumbrunn et al., 2014). Therefore, it is important to build positive teacher-student relationships, to encourage student participation in class and to approach students with warmth and openness, to be available for questions or other matters, to normalize struggles in university life, and to avoid negative statements about student success such as 'only one in four students will pass this class' (Freeman et al., 2007). As stated earlier, having a sense of belonging is a basic human need, but it is also a motive that is sufficient to drive behavior, such as engagement in class and help-seeking activities. Students' educational success and wellbeing depend in part on the extent to which students may develop themselves in a study environment where they fit in and in which they belong (Strayhorn, 2012). Therefore, the expected positive effects of enhancing the study environment apply to all students, making this an intervention for implementation at the universal level.

Further implications for (higher) education and policy
The fourth major theme concerns further implications for education and policy. The enhancement of student wellbeing is seen as an increasingly important approach to student development not only for higher education, but for education in general. It is increasingly acknowledged that education should not just be about academic outcomes, but that it is about the wellbeing of the whole child or whole young adult (Centre for Education Statistics and Evaluation, 2015). As schools have been identified as key settings for the development of students, because they spend a significant amount of time there, several school-based programs have been launched during the past few years that focus on protective factors within schools as well as on skills and knowledge that schools can teach to enhance student wellbeing (Goldberg et al., 2019). However, these programs, such as the Healthy School program in the Netherlands, are mainly aimed at a healthy lifestyle (Jongh, Leurs, Vries, & Boot, 2011; Leurs et al., 2007) and are developed for and aimed at primary education (Dutch *primair onderwijs*) and secondary education (Dutch *voortgezet onderwijs*); a few are aimed at senior secondary vocational education (Dutch *mbo*), but not on higher education. Taken together, in my opinion, the overall findings of the investigations for this dissertation represent a call for attention concerning the need for an integrated student wellbeing approach for higher education. I strongly suggest a public health approach that is intertwined with the curriculum, in which mental health is viewed as the foundation for the wellbeing and success of students during their studies and beyond, and which is based on prevention, treatment, the promotion of positive mental health and student empowerment, and a positive study environment. More fundamentally, following from the knowledge that mental health is a foundation for the wellbeing and study success

of students, all universities, regardless of their interest in mental health per se, clearly have an incentive to promote this agenda (Hunt & Eisenberg, 2010).

The proposed integrated student wellbeing approach is based on the previously published Action Plan for the Enhancement of Student Wellbeing (Dopmeijer et al., 2018) and has an explicit preventive perspective on wellbeing. This approach is aimed at *all* students and may consist of the following cornerstones:

(1) *Prevention and early identification*, i.e., screening and assessment of students' mental health, risk factors, and academic performance as well as suicide prevention programs and alcohol policies;

(2) *Promotion of mental health competencies*, i.e., mental health literacy programs and interventions regarding resilience and engagement;

(3) *Positive and supportive study environment*, i.e., a focus on activities that enhance a sense of belonging;

(4) *Staff training for student wellbeing*; staff training, counseling, and online resources to enhance the wellbeing of staff members so as to equip them to support students;

(5) *Student support services*; individual and targeted interventions, both face-to-face and online, also for specific target groups, such as first-generation students, informal caregiving students, international students, and students who identify as a member of the LGBTQ community, with the aid of care trajectories in collaboration with partners within and outside the university, such as mental health care organizations, welfare agencies, other relevant educational institutions in secondary education, secondary vocational education, and higher education.

This integrated approach may call for a shift in focus regarding the general vision on the purpose of education. Whereas for most educational settings the current leading vision is mainly focused on the development of skills, knowledge, and socialization, a lack of attention can be seen for the developmental stages in which students form their identity. Biesta introduced a third function of education, called subjectification (i.e., the emancipation of students as humans) (Biesta, 2014), which is an extension of identity formation. It is consistent with the perspective that students' professional development goes hand in hand with their personal development. Therefore, personal development should also be part of an educational vision. The inclusion of subjectification in the general educational vision seems to fill this gap and offers scope for the inclusion of integrated student wellbeing programs in (higher) education.

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This seems not only relevant for higher education, but also for education in general, starting at primary school. More specifically, from the perspective of prevention, it is to be expected that the earlier students are introduced to wellbeing themes as part of their education, the more common it will be not only for them, but also for staff members to talk about these subjects. This could contribute to the prevention of psychosocial problems and to the breaking down of barriers that hinder disclosure and help-seeking when problems do occur.

Solutions for students' psychosocial problems are often sought with the individual student and the institutions for higher education, and although they do in fact have a responsibility in finding solutions, it also seems clear that the problem is much more broadly rooted in societal developments (Raad voor Volksgezondheid en Samenleving, 2018; RIVM, 2017). The increasing degree of individualization in a performance-oriented society strongly affects emerging adults who are in the midst of a personality and identity development process in which they try to find their sense of belonging and go to great lengths to try and fit in. In this vulnerable stage, many of these young people make the transition towards becoming students in the higher educational system, a system that also seems to be noticeably influenced by the societal orientation on performance. This orientation is also seen in the use of social media, in which young people seem to chase a picture-perfect life that actually does not exist. Several reports have shown that students experience pressure not to make any mistakes, because when they do, the consequences can be profound, not only in terms of academic delay and subsequent financial problems, but also in terms of not being able to comply with what is asked of them. Because the issue transcends education and the individual student, in terms of both causes and solutions, it is imperative that responsibility for a reduction of pressure and psychosocial problems among so many young people be taken up by the Dutch government. Because it concerns an issue on the cutting edge of health care and education, it is important that this issue is addressed by both the Ministry of Health, Welfare, and Sport and the Ministry of Education, Culture, and Science in interdepartmental collaboration. Fortunately, the first steps to this end have now been taken.

DIRECTIONS FOR FUTURE RESEARCH

From the current findings reported in this dissertation, one way to move forward in research on student wellbeing is to consider the conceptualization of psychosocial problems. As suggested in the first study, there is a need for further exploration of the concept of performance pressure among students. To this end, the newly introduced

instrument for performance pressure can be further improved. In addition, it seems relevant to further investigate the possible role of performance pressure as a barrier for disclosure and help-seeking, as there are several reports that indicate that these concepts might be related. In this study, the UBOS-A was used as the gold standard for the assessment of burnout. In the meantime, a specific burnout assessment instrument for students has been developed: the Burnout Assessment Tool (BAT). It would be relevant to repeat our study with this more specific instrument for a more valid assessment of student-specific burnout symptoms.

Further research elaborating on our second study on the concurrent validity of the AUDIT-C could further validate the suggested cutoff scores for the identification of students who are at risk for alcohol use disorder, which could contribute to a more solid foundation for the AUDIT-C as the gold standard for identifying at-risk students.

The third study on the prediction of delay and dropout showed that mainly delay was difficult to predict, possibly because delay may be the result of an interplay between psychosocial problems and protective factors that were not investigated. Therefore, it seems highly relevant for future studies to broaden the prediction model with other possible predictors of academic delay, such as other psychological symptoms and possible protective determinants such as self-efficacy, resilience, and engagement, for which evidence is growing. Unfortunately, we did not take repeated measures or later measures of psychological issues into account in this study, as the students who dropped out had missing data on later assessments and these missing values were therefore 'missing not at random', which cannot be resolved with statistical techniques. Nevertheless, it is likely that later measures are better predictors of study delay and dropout. Gaining a deeper insight into the development of students' personality profiles and psychosocial problems over the course of their studies seems necessary; this is possible with the help of longitudinal studies and samples with students from all years of study, or at least several years of study. The current study also indicated that there may be significant differences in characteristics between the group of delayed students and the group of students who dropped out. As research regarding academic delay is scarce, future research is needed to improve our understanding of this phenomenon.

Overall, as young adults spend most of their time at university, more studies should focus on the contribution of university life in the development of symptoms or disorders. The network approach to psychopathology appears to be sufficiently valid for incorporating both undiagnosed symptoms and disorders among students

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in future studies and has the potential to yield not only a more detailed insight into possibly specific networks of symptoms among students in higher education, but also potentially relevant interventions.

LIMITATIONS

The findings reported in this dissertation should be interpreted in the light of a number of general limitations. First, although part of our research made a contribution to longitudinal data, which ensured reliability with respect to the results and conclusions, the other studies had cross-sectional designs, which requires a cautious interpretation of causality.

A second limitation is that only quantitative methods were used. Qualitative data, such as those included in the story of Vera, could be a valuable addition to obtain in-depth insight into students' experiences of the challenges in student life and related consequences and to cross-validate the quantitative findings. However, the students' perspectives were thoroughly studied with the help of extensive questionnaires in which students' experience was the premise.

Third, participation in online surveys might be selective, which may have affected the studies' reliability and validity. Although online data collection enabled us to access a large population and we worked with large samples, overall response rates were low. This is common with this method, but could have caused a sample selection bias (Lefever, Dal, & Matthíasdóttir, 2007). Hence, we obtained data from the Student Administration per wave regarding the enrolled student population's characteristics (e.g., mean age, distribution of gender, years of study, and faculties), for comparison with the sample characteristics of each wave. These data gave a reasonable indication of each sample's representativeness, which was deemed good. Furthermore, the blend of subjective and objective data contributed to the accuracy, consistency, and non-biased nature of the data. A valid and reliable assessment of delay and dropout and multiple, extensive, and profound methods of statistical analysis were used to answer the research questions.

Fourth, the studies discussed in this dissertation were based on self-reports only, except for the objectively measured delay and dropout data that were retrieved from the Students Administration. Generally, self-reports are found to be accurate under specific conditions. Although there are studies stating that self-reported problems may remain underreported as respondents may give socially desirable answers

(Brener, Billy, & Grady, 2003; Krumpal, 2013), other studies have shown self-reports to be a reliable method when participants are given assurances of confidentiality (Sobell & Sobell, 1990). In all studies included here, data were collected and processed anonymously, and this was explicitly communicated to the participants.

Finally, the findings discussed in this dissertation should be considered in the context of the Dutch higher educational system, a system which may differ from educational systems in other countries. This may limit the generalizability of our findings. Although there is no reason to assume that the results found in the present study will be greatly different from those that might be found elsewhere, one should be careful about translating these results directly to other student samples.

GENERAL CONCLUSION

The work done for this dissertation has improved our understanding of the impact of challenging student life on wellbeing and academic performance. It has shown that, perhaps more strongly now than was previously the case, student life is about meeting high expectations, a development that transcends education and the individual student in terms of both causes and solutions. This makes it imperative that responsibility for the reduction of pressure and psychosocial problems among so many young people be taken up by the Dutch government, and most notably by the Ministry of Health, Welfare, and Sport as well as the Ministry of Education, Culture, and Science.

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6

EPILOGUE

*Here comes the sun, and I say
It's all right*

Here comes the sun
The Beatles (1969)

HOW VERA'S STORY ENDED

'Do you have a minute?' This is what she said the day we met. I had just finished the lecture I gave to substitute for an absent colleague in a faculty-wide minor programme she was attending. Because I usually gave other classes, we didn't know each other very well. 'Sure, how can I help you?', I said. She told me her story and that she had struggled with the dilemma of disclosure for a long time, because she wasn't sure that her story would be taken seriously. She was afraid of what others would think of her. She doubted whether she had done enough to keep up with classes and assignments despite her circumstances, and she felt ashamed of being delayed in her studies. She also seemed to think that she was no different than any other student and that she had to fix her issues on her own, 'just like everyone else'. She told me she feared that sharing her story might not be helpful, or even worse, that it might turn against her, for instance through negative evaluations by lecturers who would not find her suitable for her studies as a result of poor coping skills. Despite all of her concerns, she did seem to realize the severity of her circumstances and her symptoms of exhaustion, depression, and loneliness. Therefore, when she became increasingly desperate as her problems evolved, she concluded that she had to seek help. Although we did not know each other well, she felt that she could trust me with her story and that with my help she could make a difference. And she did. After several months of my mentoring her, a period in which she lost her mother and came back after a period of grief, she graduated after finishing her final assignment with flying colors. Following her graduation ceremony, she waited for me with a bunch of flowers to thank me. I thanked her for trusting me and praised her for her own ability to make it to the finish line. It was on that day that I decided to stand up for students like Vera and make it my personal mission to determine how we may guide students in facing the challenges of student life and making it to the finish line. Simply because they all deserve the chance to graduate.

*The name is fictitious for privacy reasons

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APPENDIX

FUNDING AND AUTHOR CONTRIBUTIONS

Author Contributions

Chapter 2:
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All authors were responsible for the study design. Jolien Dopmeijer collected the data. Jolien Dopmeijer and Christine Schutgens were responsible for the statistical analyses and interpretation of the data in agreement with all authors. Jolien Dopmeijer and Christine Schutgens wrote the manuscript. All authors reviewed the manuscript. In addition, we are grateful to Margot Peeters for her contribution to the path analysis.

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All authors were responsible for the study design. Jolien Dopmeijer and Claudia Van der Heijde collected the data. Sanne Verhoog and Jolien Dopmeijer were responsible for the statistical analyses and interpretation of the data in agreement with all authors, and wrote the manuscript. All authors reviewed the manuscript and approved the final version for publication.

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Predicting the risk of academic delay and dropout for students in higher education based on personality profiles and psychosocial problems.

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A

RUNNING ON EMPTY
The impact of challenging student life on wellbeing
and academic performance

SUMMARY

Although student life, with all its new experiences and challenges, is often referred to as a very positive period in life, many students, in fact, experience it as a difficult and stressful time. Starting university is a key life transition that takes place in a crucial developmental period when students make the transition from late adolescence to young adulthood. On top of that, today's performance-oriented and individualistic society makes many young people feel burdened by performance pressure. Mental health problems are highly prevalent among students, which has become a growing concern, but what appears to be even more concerning is that the majority of students with psychosocial problems are not receiving treatment, as a result of experienced barriers in disclosure and seeking help. It is known that psychosocial problems often lead to poor academic performance, which may lead to academic delay and dropout. Unfortunately, differences in assessment of students' psychosocial problems impede the adequate interpretation of these problems, and factors that predict them and predict the lack of disclosure and help-seeking are unclear. Therefore, the overall aim of this dissertation was to provide insight into the characteristics of students with psychosocial problems and the valid and reliable assessment of these characteristics. Another aim was to provide insight into the association between students' psychosocial problems and academic delay and dropout. Furthermore, this dissertation aimed to provide insight into predictors of students' psychosocial problems as well as disclosure and help-seeking behavior when these problems occur.

In **Chapter 2**, the impact of performance pressure, loneliness, and sense of belonging on the underlying dimensions of burnout (i.e., emotional exhaustion, depersonalization, and personal accomplishment) was investigated. The results of this study revealed that performance pressure and loneliness were significantly associated with the three dimensions of burnout. However, results suggested that mainly sense of belonging could be targeted as a candidate for enhancing student wellbeing with the aim to improve their ability to cope with the high demands of student life and to prevent burnout.

In **Chapter 3**, the concurrent validity of the Alcohol Use Disorder Identification Test – Consumption (AUDIT-C) was examined in a sample of students in order to determine

the most appropriate cutoff points for the student population. Hazardous drinking is a growing concern among students in higher education. The AUDIT-C is the abbreviated version of the AUDIT, a screening instrument for measuring hazardous alcohol use among the adult population, developed by the World Health Organization (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). So far, a gold standard for identifying high-risk drinking students in higher education has been lacking, and there has been little evidence for the concurrent validity of the AUDIT-C as a screening instrument for this group. Results revealed that the AUDIT-C appears to be valid in terms of identifying hazardous and harmful drinking students, with suggested optimum cutoffs 7 (females) and 8 (males). However, considerations regarding avoiding false-positives versus false-negatives, in relation to the type of intervention following screening, could lead to the selection of different cutoffs.

In **Chapter 4**, it was examined whether students' psychosocial problems, self-esteem, and personality profiles could predict academic delay and dropout. Delay and dropout are a major problem among students in higher education. In this longitudinal study, a prediction model based on symptoms of anxiety, depression and hazardous alcohol use, self-esteem and anxiety sensitivity, hopelessness, impulsivity and sensation seeking was developed based on data on a freshmen cohort. The model was validated with data on a second freshmen cohort. An interesting finding was that no significant relationship between psychosocial problems and delay or dropout was found, while a brief inventory of personality risk profiles did in fact contribute to the prediction of delay and dropout. However, the findings also suggest that delay and dropout are not easily predicted exclusively on the basis of freshmen problems and personality profiles. Future research may add other personality characteristics, psychosocial problems, and factors such as resilience. Nevertheless, universities are advised to develop and test screening tools for the early identification of at-risk students and to implement preventive student wellbeing programs that may promote students' mental health and subsequently combat delay and dropout.

In **Chapter 5**, predictors of students' disclosure and help-seeking behavior based on their perceived public and personal stigma was examined, as well as students' attitudes towards disclosure and help-seeking behavior. Results showed that the participants were a distressed group with also prevalent hazardous alcohol use, who experienced little perceived public and personal stigma and had rather unfavorable attitudes towards disclosure and help-seeking. Accordingly, this group showed little actual disclosure and help-seeking. Results indicated that perceived public and personal stigma did not predict disclosure and help-seeking behavior, but that

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attitudes towards disclosure and help-seeking did. Disclosure and seeking help for mental health challenges are health promoting competencies that would appear to need greater attention in university students. Although further research needs to validate these findings, it is recommended to promote disclosure and help-seeking behavior among students by investing in mental health literacy programs to educate students about mental health issues, raise awareness on available mental health services and their potential benefits.

The findings represent a call for attention concerning the need for an integrated student wellbeing approach for higher education. It is suggested to develop a public health approach which is designed to meet the mental health needs of *all* students and that is intertwined with the curriculum. In this approach, mental health is viewed as the foundation for the wellbeing and success of students during their studies and beyond, and which is based on prevention, treatment, the promotion of positive mental health and student empowerment, and a positive study environment. This also asks for the addition of students' *personal* development to the educational vision of schools.

Future research should further investigate the valid and reliable screening and assessment of psychosocial problems, as well as the impact of protective factors, such as resilience and engagement, on student wellbeing and their academic performance. Furthermore, future research should investigate whether the network approach to psychopathology could contribute to a clearer conceptualization and understanding of students' psychosocial problems.

Because the issue of students' psychosocial problems transcends education and the individual student, in terms of both causes and solutions, it is imperative that responsibility for a reduction of pressure and psychosocial problems among so many young people be taken up by the Dutch government. Because it concerns an issue on the cutting edge of health care and education, it is important that this issue is addressed by both the Ministry of Education, Culture, and Science and the Ministry of Health, Welfare, and Sport in an interdepartmental collaboration.

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RUNNING ON EMPTY
The impact of challenging student life on wellbeing
and academic performance

NEDERLANDSE SAMENVATTING (DUTCH SUMMARY)

Hoewel het studentenleven, met vele nieuwe ervaringen en uitdagingen, vaak wordt gezien als een van de mooiste periodes in het leven ervaren veel studenten deze periode als een moeilijke en stressvolle tijd. De fase van starten met studeren is een belangrijke levensverandering, die plaatsvindt in een cruciale ontwikkelingsfase van studenten, waarin zij de transitie maken van adolescentie naar jongvolwassenheid. Daar bovenop draagt de huidige prestatiegerichte en individualistische maatschappij bij aan dat veel jonge mensen last hebben van prestatiedruk. Er zijn in toenemende mate zorgen over frequent voorkomende psychosociale problemen bij studenten, maar wat mogelijk nog zorgwekkender is, is dat de meerderheid van de studenten met psychosociale problemen geen hulp krijgt. Dit is het gevolg van belemmeringen die studenten ervaren in het open zijn over hun problemen en het vragen om hulp. Het is bekend dat psychosociale problemen vaak leiden tot verminderde studieprestaties, welke mogelijk kunnen leiden tot studievertraging- en uitval. Helaas wordt een adequate interpretatie van deze problemen belemmerd door verschillen in screening en diagnostiek. Ook is er nog veel onduidelijk over welke factoren deze psychosociale problemen voorspellen, evenals welke factoren het gebrek aan openheid en hulp zoeken voorspellen. Om die reden was het doel van dit proefschrift om inzicht te krijgen in de kenmerken van studenten met psychosociale problemen en de valide en betrouwbare screening en diagnostiek hiervan. Een ander doel was om inzicht te krijgen in de relatie tussen de psychosociale problemen van studenten en studievertraging- en uitval. Een laatste doel van dit proefschrift was het krijgen van inzicht in de factoren die psychosociale problemen van studenten voorspellen, evenals de factoren die openheid en hulpzoekend gedrag voorspellen wanneer deze psychosociale problemen zich voordoen.

In **hoofdstuk 2** werd de impact van prestatiedruk, eenzaamheid en je thuis voelen (sense of belonging) op de onderliggende dimensies van burn-out (emotionele uitputting, distantie en (verminderde) competentie) onderzocht. De resultaten van dit onderzoek lieten zien dat prestatiedruk en eenzaamheid significant gerelateerd zijn aan de drie dimensies van burn-out. Echter, de resultaten wijzen erop dat de mate waarin een student zich thuis voelt (sense of belonging) binnen een hogeschool of universiteit het meest bij kan dragen aan het bevorderen van studentenwelzijn,

waarbij de ervaring van je thuis voelen het vermogen van de student verbetert om te leren omgaan met het veeleisende studentenleven en daarmee kunnen burn-out klachten worden voorkomen.

In **hoofdstuk 3** is de concurrente validiteit van de Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) onderzocht met een steekproef van studenten, met als doel om bij dit screeningsinstrument de best passende afkappunten vast te stellen voor de studentenpopulatie. Er zijn in toenemende mate zorgen over het riskante drinkgedrag van studenten. De AUDIT-C is een verkorte versie van de AUDIT, een screeningsinstrument voor het screenen van problematisch alcoholgebruik bij volwassenen, welke is ontwikkeld door de Wereldgezondheidsorganisatie (World Health Organization, WHO). Tot zover was er nog geen gouden standaard voor het identificeren van studenten in het hoger onderwijs met hoog risico op problematisch drinken of alcoholafhankelijkheid vanwege hun riskante drinkgedrag, en was er weinig onderbouwing voor de geschiktheid van de AUDIT-C als screeningsinstrument voor deze doelgroep. De resultaten lieten zien dat de AUDIT-C een valide screeningsinstrument blijkt te zijn voor het identificeren van studenten met riskant en problematisch drinkgedrag, met voorgestelde afkappunten 7 (vrouwen) en 8 (mannen). Overwegingen omwille van het vermijden van vals-positieve versus vals-negatieve uitkomsten, in relatie tot het type interventie dat volgt na de screening, kunnen leiden tot de keuze voor andere afkappunten.

In **hoofdstuk 4** werd onderzocht of de psychosociale problemen, het zelfvertrouwen en de persoonlijkheidsprofielen van studenten hun studievertraging- en uitval konden voorspellen. Studievertraging- en uitval vormen grote problemen onder studenten in het hoger onderwijs. In dit longitudinale onderzoek werd er een voorspellingsmodel ontwikkeld op basis van symptomen van angst, depressie en riskant alcoholgebruik, zelfvertrouwen en de persoonlijkheidskenmerken angstgevoeligheid, hopeloosheid, impulsiviteit en sensatie zoeken van een cohort eerstejaars studenten. Het model werd gevalideerd met data van een tweede cohort eerstejaars studenten. Een interessante bevinding was dat de resultaten lieten zien dat er geen significante relatie werd gevonden tussen psychosociale problemen en studievertraging- en uitval, terwijl een korte inventarisatie van persoonlijkheidsprofielen wel bleken bij te dragen aan de voorspelling van studievertraging- en uitval. De resultaten suggereren echter ook dat studievertraging- en uitval niet eenvoudig te voorspellen zijn op basis van uitsluitend eerstejaars studenten en persoonlijkheidsprofielen. Het is aan te bevelen dat in vervolgonderzoek andere persoonlijke kenmerken, psychosociale problemen en beschermende factoren, zoals veerkracht, toevoegen worden aan

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het voorspellingsmodel. Desalniettemin wordt Nederlandse hogescholen en universiteiten aanbevolen om studenten te screenen op psychosociale problemen ten behoeve van vroege identificatie van risicostudenten en om preventieve studentenwelzijnsprogramma's te implementeren die de mentale gezondheid van studenten kunnen bevorderen en dientengevolge mogelijk vertraging en uitval te kunnen reduceren.

In **hoofdstuk 5** werden waargenomen publiek stigma en persoonlijk stigma, evenals de attitudes van studenten ten opzichte van openheid over psychosociale problemen (in dit onderzoek angst- en somberheidsklachten en risicovol alcoholgebruik) en hulpzoekend gedrag onderzocht als mogelijke voorspellende factoren van daadwerkelijke openheid over problemen en daadwerkelijk hulp zoeken. Resultaten lieten zien dat de steekproef bestond uit een groep studenten met veel psychosociale problematiek en riskant alcoholgebruik, maar dat zij weinig waargenomen publiek en persoonlijk stigma ervoeren. Verder toonden de resultaten dat deze studenten een weinig positieve attitude hadden ten opzichte van open zijn over psychosociale problemen en het zoeken van hulp hiervoor. De resultaten lieten ook zien dat waargenomen publiek en persoonlijk stigma openheid en hulpzoekend gedrag niet voorspelden, maar dat de attitudes van studenten ten aanzien van openheid en hulpzoekend gedrag dat wel deden. Openheid en hulpzoekend gedrag voor psychische problemen zijn gezondheidsbevorderende competenties die meer aandacht lijken te verdienen bij studenten in het hoger onderwijs. Alhoewel vervolgonderzoek nodig is om deze bevindingen te valideren, wordt aanbevolen om openheid en hulpzoekend gedrag te bevorderen bij studenten door te investeren in programma's met als doel om mentale gezondheidsvaardigheden te bevorderen, door studenten voor te lichten over psychische problemen en hun bewustzijn te vergroten ten aanzien van beschikbaar hulpaanbod en diens potentiële voordelen.

De bevindingen vragen aandacht voor een integrale aanpak voor studentenwelzijn in het hoger onderwijs. Er wordt een publieke gezondheidsbenadering voorgesteld die wordt geïntegreerd in het curriculum, een aanpak die is ontworpen om te voorzien in de mentale gezondheidsbevordering van *alle* studenten en waarin mentale gezondheid wordt beschouwd als de basis van welzijn en studiesucces van studenten tijdens hun studie en erna. Deze benadering is gebaseerd op preventie, behandeling, het bevorderen van positieve mentale gezondheid en het zelfmanagement van studenten, evenals een positief studieklimaat. Dit vraagt tevens om het toevoegen van de persoonlijke ontwikkeling van studenten aan de onderwijsvisie van scholen.

Vervolgonderzoek zou kunnen worden gericht op het verder onderzoeken van valide en betrouwbare screening van psychosociale problemen, en op de impact van beschermende factoren zoals veerkracht en bevlogenheid op het welbevinden en studieprestaties van studenten. Verder zou in vervolgonderzoek onderzocht kunnen worden of de netwerkbenadering voor psychopathologie bij kan dragen aan betere conceptualisatie en een beter begrip van psychosociale problemen van studenten.

Omdat het vraagstuk van de psychosociale problemen bij studenten het onderwijs en de individuele student overstijgt in termen van zowel oorzaken als oplossingen, is het absoluut noodzakelijk dat de verantwoordelijkheid voor het verminderen van de mentale druk op jongeren ervaren evenals de psychosociale problemen bij studenten wordt opgepakt door de Nederlandse overheid. Omdat het een vraagstuk betreft dat op het snijvlak ligt van onderwijs en gezondheid, is het belangrijk dat dit wordt geadresseerd door zowel het Ministerie van Onderwijs, Cultuur & Wetenschap als het Ministerie van Volksgezondheid, Welzijn & Sport in een interdepartementale samenwerking.

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Toen ik eind juli 2020 de laatste punt zette van dit proefschrift en het begin augustus naar de promotiecommissie werd gestuurd, maakte ik de overstap naar het Teachers

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CURRICULUM VITAE

Jolien Mariët Dopmeijer was born on August 3rd, 1982 in Emmeloord, The Netherlands. After completing secondary education at the Zuyderzee College in 1999, she studied at the Bachelor of Nursing program at Windesheim University of Applied Sciences. During her studies, she did two of her internships in addiction health care at Meerkanten GGz, where her interest in mental health arose. She started working there as a nurse after her graduation in 2003 at the detoxification unit. During her work she became more interested in research. In 2004 Jolien started her training Nursing Science at Utrecht University and during this training she started working as a policy officer and project manager at Adhesie GGz in Deventer at the Quality, Innovations and Research Department. In 2007 she graduated from university. In 2008, she started working as a lecturer at Windesheim University of Applied Sciences (UAS) at the Bachelor of Nursing program where she had studied herself. In 2010 she joined professor Rob Bovens' new research group Addiction Prevention at Windesheim UAS, besides her lecturer position. Together with Rob she started her work on student wellbeing in Project #FIVE, somewhat later joined by project manager Danielle Schwartz, with whom she worked at this topic for years. The research that was part of this project became the start of Jolien's PhD research in October 2014 under supervision of Prof. Reinout Wiers, and was funded by the Netherlands Organization for Scientific Research (NWO) with a PhD grant for lecturers in higher education. From the start of her PhD research Jolien initiated or was involved in several initiatives regarding student wellbeing, such as the Action Plan for the Enhancement of Student Wellbeing, which was a result of a collaboration between universities, student unions and the field of mental health care. From this collaboration the National Student Wellbeing Network was established, of which Jolien is a board member. In September 2020 she started working as a project manager of the Student Programs at the Trimbos Institute, and as a senior lecturer and researcher at Teachers College at Windesheim UAS. Jolien lives in Zwolle with Robin and her son Hugo (2009) and daughter Loïs (2013).

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So line on up, take your place
And show your face to the morning
'Cause one of these days you'll be born and raised
And it all comes on without warning

Born and raised
John Mayer (2011)